Augmenting Michigan's Water Conservation and Efficiency Efforts: Climate, Energy, and Water Infrastructure

Prepared for the Michigan Department of Environment, Great Lakes and Energy (EGLE)

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Acknowledgements

This report was developed by a team of interdisciplinary Masters candidates from the University of Michigan's Medical School, School for Environment and Sustainability (SEAS), A. Alfred Taubman College of Architecture and Urban Planning, and the Gerald R. Ford School of Public Policy on behalf of the Michigan Department of Environme
nt, Great Lakes and Energy (EGLE). This one-year collaborative project was funded by the Dow Sustainability Fellows Program at the University of Michigan and was guided by our client Emily Finnell at EGLE. We are grateful for the support of our faculty advisor Dr. Jennifer Read and our Dow Fellows project advisor Dr. Margaret Wooldridge. During this project, we also received insight from subject-matter experts in the field of water conservation and efficiency.

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Project Charge

The State of Michigan has policies and programs to address climate, energy, and water that will also help to achieve Michigan's water conservation and efficiency goals and objectives established under the Great Lakes-St Lawrence River Basin Water Resources Compact (Compact). The Water Use Advisory Council (WUAC) is a stakeholder group appointed by the Governor, Senate and House leaders and Director of the Department of Environment, Great Lakes and Energy (EGLE). It is set up to advise the state Quality of Life agencies (EGLE, Department of Natural Resources and Department of Agriculture and Rural Development) on best ways to implement the Compact's provisions in Michigan. The Water Conservation and Efficiency Subcommittee of WUAC is responsible for advising and making recommendations to the WUAC on opportunities to improve and enhance Michigan's water conservation and efficiency program and support sustainable water use. The WCE Committee is working to ensure that businesses, industry, agriculture, utilities, communities and the public have the best available information, tools and technologies to improve efficient use, and conservation, of water resources to ensure the sustainability of our water resources.

In the WUAC 2020 Legislative report (WUAC 2020), the Council recommended conducting an assessment of Michigan's current climate, energy, sustainability and water infrastructure policies and programs to identify specific policies and programs, not already reported, that fulfill Michigan's Compact obligations and identify any gaps. The WUAC identified the following needs:

- Assess Michigan's current climate, energy, sustainability and water infrastructure policies and programs to identify specific policies and programs, not already reported, that fulfill Michigan's Compact obligations and identify any gaps.
- Review the 5-year Compact program reviews from the other Great Lakes states and provinces to identify exemplar innovative water conservation and efficiency programs, resources and initiatives that Michigan could consider to improve its program.
- Develop benchmarking or case studies of other exemplar conservation and efficiency programs, and technologies targeting major water sectors in water rich states to identify specific programs that Michigan should consider adopting.
- Review federal water conservation and efficiency programs, such as the U.S. Environmental Protection Agency's (EPA) WaterSense Program to identify programs, resources that Michigan could use to improve its water conservation and efficiency program.
- Research new and innovative programs that employ just, equitable and sustainable approaches to efficient use and conservation of water resources for communities disproportionately affected by historic inequities.

In response to this recommendation, EGLE's Office of the Great Lakes sponsored a Dow Fellows project to assist with advancing progress toward this recommendation.

Methodology

Our research objectives were accomplished by conducting a thorough literature review of programs related to water conservation and efficiency, climate, energy, water infrastructure, and sustainability in

Michigan to identify programs that contribute to the state's Water Conservation and Efficiency Program goals and objectives. We then worked with the Office of the Great Lakes to identify and interview program and policy experts from select departments of state government to augment and clarify the results from the literature review.

Following our research on Michigan's programs, we expanded our scope to look at water conservation and efficiency programs in the other Great Lakes states and four identified water-rich states outside the region. Using results from the literature review and interviews, we identified several areas where further programmatic development could enhance Michigan's efforts to achieve water conservation and efficiency goals and objectives under the Compact.

The following goals guided our research:

Goal 1: Assess the current contributions of Michigan's climate, energy, water infrastructure, and sustainability policies toward the water conservation and efficiency goals and objectives that are part of Michigan's commitments under the Great Lakes Compact. Describe any gaps between the current policies and the Compact's goals and objectives and identify opportunities to advance progress towards these goals.

Goal 2: Identify water conservation policies, programs and initiatives from other Great Lakes states/provinces that may address the identified gaps in Michigan's water conservation efforts.

Goal 3: Develop an understanding of the water conservation and efficiency programs implemented in other water-rich states that may offer additional opportunities for Michigan.

Goal 4: Determine where federal financial assistance and collaboration can be increased or established to advance the State of Michigan's water conservation objectives.

Goal 5: Develop recommendations for advancing the state of Michigan's progress on achieving the water conservation and efficiency goals and objectives under the Compact.

Literature & Matrix Review Methodology

We conducted a thorough literature review of Michigan's water conservation programs operated by the Department of Environment, Great Lakes, & Energy (EGLE) in relation to compliance with the Great Lakes Compact. This review also included programs outside of EGLE that involve water conservation aspects with the majority of which were found within the Department of Agriculture & Rural Development. We split the literature review amongst all team members to identify water conservation and efficiency programs within four overarching categories: climate, energy, sustainability, and infrastructure. The next steps involved navigating various Michigan state department websites for any programs related to water conservation and efficiency. Team members discussed findings with each other and any overlapping programming. Once complete, the team reported back to the client and

spoke to various employees involved with water conservation in EGLE to cross-check findings (see interview methodology for more information).

In addition to Michigan and other Great Lakes states, we analyzed programs in Florida, Louisiana, Colorado, and Missouri that may meet the needs identified in our research of Michigan's programs.[1] We created the following matrix to determine states with similarities to Michigan's water use and policy landscape.

To develop the matrix, we assessed states based on their freshwater resources, water use, demographics, and geography. We identified states with similar freshwater resources as Michigan, square miles of surface freshwater, and water use, water withdrawals (surface and groundwater) in millions of gallons per day, using water data provided by the U.S. Geological Survey's "How Wet is Your State? The Water Area of Each State" (USGS, 2018) and U.S. Geological Survey's "Total Water Use in the United States (USGS, 2018). We identified states with similar demographics to Michigan (age, race, ethnicity, education, relationship status, veteran status, income, poverty rates, occupations, and housing) using the Election State Similarity Index. Finally, we identified the other seven Great Lakes states as being geographically similar to Michigan.

For the literature review of water-rich states, each team member was assigned a different state to further research. A majority of this information was collected from these states' equivalents of EGLE's Office of the Great Lakes. This information was then discussed as a team and provided the backbone of many of the questions asked of these states (see interview methodology for more information). Table 1 can be found on the next page:

[1] After conducting interviews with Michigan state employees, it was recommended we include Florida due to an interviewee's prior research and understanding of the State's policies.

Table 1. States with Similar Water Use Regimes and Policy Landscape to Michigan

	Freshwater resources	Water use	Demographics	Geography	Total Factors (1-4)
Alaska	x				1
Arkansas		x			1
California		x			1
Colorado**	x	x			2
Delaware	x				1
Florida	x	x			2
Hawaii	x				1
Idaho		x			1
Illinois*	x	x	x	x	4
Indiana*	x		x	x	3
Louisiana	x	x			2
Massachusetts	x				1
Minnesota*	x			x	2
Missouri		x	x		2
Montana		x			1
Nebraska		x			1
New York*	x	x		x	3
North Carolina		x			1
Ohio*	x		x	x	3
Pennsylvania*	x	x	x	x	4
Rhode Island	x				1
Texas		x			1
Wisconsin*	x			x	2

*Great Lakes States and Compact signatories

** While Colorado is governed by western water law, which recognizes appropriative rights, and Michigan water law recognizes riparian rights, the state ranked high enough in the matrix for us to investigate further. Upon investigation, Colorado's public engagement and outreach is where we saw opportunities from which Michigan might benefit.

Interview Methodology

In parallel with the literature review, we conducted interviews with policy experts and program managers and staff from Michigan's Quality of Life agencies who work with water conservation and efficiency programs as well as other programs, e.g., climate change, energy, water infrastructure, that may contribute toward the State's water conservation and efficiency goals and objectives under the Compact. After identifying areas for further development in Michigan, we conducted interviews with policy experts and program managers in each of the other Compact states. We also interviewed experts in four water-rich states outside of the Great Lakes basin that are implementing water conservation programs -- Florida, Colorado, Louisiana and Missouri -- and the US EPA to identify potential state and federal programs that could potentially fill the identified gaps. Several individuals or state teams opted to provide written responses to our questions.

Blinded interview transcripts and written responses are in the Appendix.

We identified the following individuals for interviews:

Table 2. List of Interviewees Continued

Name	State	Title	Department
Dr. Brandy Brown**	Michigan	Former Climate and Energy Adviser	Michigan Department of Environment, Great Lakes, and Energy (EGLE), Office of Climate and Energy
Jim Milne* Andrew LeBaron*	Michigan	Water Use Assessment Unit Supervisor Environmental Quality Analyst	Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Use Program
Abigail Eaton	Michigan	Environmental Resource Specialist	Michigan Department of Agriculture and Rural Development, Environmental Stewardship Division
Ninah Sasy**	Michigan	Former Clean Water Public Advocate	Michigan Department of Environment, Great Lakes, and Energy (EGLE), Office of the Clean Water Public Advocate
James Clift	Michigan	Deputy Director	Michigan Department of Environment, Great Lakes, and Energy (EGLE)
Julie Staveland	Michigan	Sustainability Section Manager	Michigan Department of Environment, Great Lakes, and Energy (EGLE), Materials Management Division, Sustainability Section

Table 2. List of Interviewees Continued

Name	State	Title	Department
Kelly Green	Michigan	Administrator of Water Infrastructure Financing	Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Infrastructure Financing Section
Regina Strong***	Michigan	Environmental Justice Public Advocate	Michigan Department of Environment, Great Lakes, and Energy (EGLE)
Donald Zelazny	New York	Great Lakes Coordinator	New York State Department of Environmental Conservation (DEC)
RJ Pire	Wisconsin	Water Policy Advisor	Public Service Commission of Wisconsin
Shaili Pfeiffer	Wisconsin	Staff Specialist	Wisconsin Department of Natural Resources (DNR), Water Use Section
Russ Sands	Colorado	Water Supply Program Manager	Colorado Water Conservation Board
Carmel Nelson	Minnesota	Water Conservation Consultant	Minnesota Department of Natural Resources (DNR), Water Appropriations Permit Program
Tim Bruno	Pennsylvania	Chief	Pennsylvania Department of Environmental Protection (DEP), Office of the Great Lakes
Mark Basch* Allison Mann*	Indiana	Head Water Use Program Coordinator	Indiana Department of Natural Resources (DNR), Division of Water, Water Rights & Use Section
Bradley Lodge* Lori Emler*	Ohio	Program Manager Environmental Analyst	Ohio Department of Natural Resources (DNR), Water Inventory and Planning Program
Cary McElhinney	US EPA Region 5	Program Coordinator	US EPA Region 5, Ground Water and Drinking Water Branch

* Joint interview or response

** No longer serving in their listed title as of December 2021

***Not available for interview

We asked the following questions to Michigan agency personnel:

1. Which programs/policies implemented by your unit/agency/organization contribute to water conservation and efficiency in Michigan?
2. Which programs/policies implemented by your unit/agency/organization do you believe are the most effective in supporting water conservation and/or efficiency in Michigan? Why?
3. Are there any areas where you feel that Michigan has excelled at, in terms of water conservation and efficiency? Where do you think improvements could be made?
4. What sectors and/or stakeholders do you work with to implement or create programs?
5. What sectors do you think have the greatest potential for improving conservation and efficiency and how does your unit/agency/organization work towards making improvements in these areas?
6. What are the individual motivations and incentives within sectors that your unit/agency/organization works with that drive water conservation and efficiency?
7. What challenges or issues has your unit/agency/organization faced implementing water conservation and/or efficiency programs and policies? How are you overcoming these challenges?
8. What opportunities do you see with new energy, climate and water infrastructure policies and programs to advance water conservation in Michigan?
9. What do you see as gaps or opportunities for further water conservation programming within or outside of your current program area?
10. Are there any white papers or publications in relation to the programs that we discussed that we should read?
11. Do you have any contacts that could provide more perspective on the topics we discussed?
12. What questions should have we asked that we didn't?

We asked the following questions to state and federal agency personnel outside the state of Michigan:

1. Are there any areas where you feel that your state has excelled at meeting or exceeding the requirements in the Compact in terms of water conservation and efficiency? Where do you think improvements could be made [if applicable]?
2. What sectors do you think have the greatest potential for improving conservation and efficiency and how does your state work towards making improvements in these areas?
3. What challenges or issues is your state experiencing in achieving its water conservation goals and objectives? How are you overcoming these challenges?
4. Are there any conservation initiatives that your state promotes that you think could be beneficial to other states?
5. Which programs/policies implemented by your agency/organization do you believe are the most effective in supporting water conservation and/or efficiency in your state from an environmental justice/water equity perspective? Why?
6. Are there any areas where you feel that your state has excelled in terms of water conservation and efficiency in terms of environmental justice/water equity? Where do you think improvements could be made?
7. What measures would you recommend be added to your state's water conservation efforts that are not already in place?

Findings

Common Themes Across Interviews

After considering the information gleaned through interviews and the literature review in the context of what we learned about current Michigan programs, we identified several categories where there are promising opportunities for strengthening programs that Michigan could explore. We outline the categories and key opportunities within each in the matrix below.

Table 3. Themes and Opportunities Identified in Interviews

		Interviews																
Themes Emerging from Interviews	**Opportunities**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**Total**
Public and Industry Engagement	Broad Public Education	X	X	X		X			X	X		X		X	X			9
	Community Empowerment through Engagement		X	X					X									3
	Local Watershed Conversations	X		X		X			X				X			X		6
Data and Technology	Baseline Data Collection	X			X	X				X			X				X	6
	Innovative Technology and Research	X				X				X		X		X				5
	Reporting and Auditing within Voluntary Programs	X			X					X			X	X	X		X	7
Funding and Infrastructure	Infusing Water Conservation into Goals of Other Programs		X				X	X								X		4
	Infrastructure Investment within Energy-Water Nexus		X	X	X		X	X		X	X			X		X		9

Opportunities for Water Conservation and Efficiency Program Enhancement

Public and Industry Engagement

1. *Broad public education is fundamental to widely accepted conservation practices*: To date, Michigan has not had a dedicated statewide public outreach effort targeting the general public

about the importance of water conservation compared to the effort expended in other states. A statewide public outreach program led by the State could have a profound impact on knowledge, attitudes, behaviors, which can lead to increased support for water conservation, municipal and other public water system investment; and, in education the general public on the connection between water quality and water quantity in conservation efforts. This effort requires all state departments and agencies within Michigan to address water conservation issues when possible.

Example: EGLE can leverage existing EPA WaterSense materials to engage with current water conservation-education organizations and programs. These materials provide scientifically vetted, "ready-to-go" resources to educate the public about how individuals can take steps to conserve water.

2. *Communities should be empowered to address water challenges through public engagement:* Public engagement can encourage communities to begin thinking about the potential climate scenarios that may impact water availability in the future, and how these scenarios may affect long-term sustainable water use. Michigan should develop or adapt public engagement programs that integrate new data, methods, and approaches to highlight/convey changing environmental conditions in order to help guide communities toward long-term sustainable water uses. To this end, scenario planning can support communities in the exploration of potential futures, and in creating a common vision of a desirable future.

   Example: Colorado's Water Plan (2015) describes how the state government employed scenario planning to guide the development of future policies. A collaborative and participatory process, which included stakeholders from the private, public, and non-profit sectors, developed scenarios looking 20 years into the future for each of Colorado's nine water basins -- representing the eight major rivers in the state and the Denver Metropolitan Statistical Area. In preparation for the scenario planning, each basin developed multiple scenarios which focused on low, medium, and high future water needs and that incorporated conservation, agricultural transfers, water reuse, and other water projects. Thirty-four different scenarios at the basin level resulted from this phase. After talking with stakeholders and analyzing the plans, state personnel identified ten high-impact drivers and compared them against the 34 scenarios to create five guiding scenarios in the *Colorado Water Plan.* These were: Business As Usual, Weak Economy, Cooperative Growth, Adaptive Innovation, and Hot Growth. One of the biggest outcomes of this method was people seeing how their actions in one watershed could affect those in other watersheds across the state. People saw how high-withdrawal or failure to execute water conservation techniques in their basin affected their neighbors and people in other basins. We heard in many interviews that Michiganders continue to believe that because Michigan is a water rich state, conserving water is not a priority. A scenario planning process, such as Colorado used, could help bridge the gap in Michigan between the perception of water abundance and the local reality of water scarcity by providing a visual demonstration of the value of water conservation.

3. *Communities play an important role in local watershed conversations:* Currently, only certain areas in Michigan are experiencing water scarcity making the issue a highly localized one. Given this, community forums are fitting venues for the state to engage the public in facilitated and potentially challenging conversations about water equity that identify concrete ways people can conserve water.

   Example: Part 312, Watershed Alliances, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, states, "two or more municipalities, by resolution of their respective governing bodies, may establish a watershed alliance for the purpose of studying problems and planning and implementing activities designed to address surface water quality or water flow issues of mutual concern within the portion of a watershed located within their boundaries." Encouraging the early establishment of watershed alliances could ease future water use conflicts. In these watersheds, users will have already built relationships with other water users in the watershed and therefore may have the ability to make decisions together as a group on the foundation of that established trust and communication. Promoting and leveraging the development of watershed alliances can help establish long-term water use as a foundational piece of community and economic development strategies.

   Example: As outlined Part 327, Great Lakes Preservation, of the NREPA, water users making large quantity withdrawals in the same watershed are encouraged to establish Water User Committees to work cooperatively in order to resolve water conflicts or potential adverse resource impacts. Committees can work together to evaluate the status of current water resources, water use trends in the watershed, and identify voluntary actions to manage trends that could lead to adverse resource impacts.

Data and Technology

4. *Baseline data collection is valuable for users tracking their conservation and efficiency measures:* Metering water usage allows for the establishment of baseline metrics so users can better understand their water usage. Metering may be an opportunity for water users to further understand their water use -- including daily and seasonal patterns as well as total amounts used, and therefore identify areas where water conservation and efficiency could result in monetary savings. Additionally, more widespread use of metering could help identify gaps between authorized water use volumes and actual water use volumes which could, in turn, aid water user committees in identifying potential solutions to water use disputes in depleted sub-watersheds. With appropriate education and training, metering can aid in data-driven decision making and provide water users the ability to measure their conservation and efficiency practices.

Example: Wisconsin requires all high-capacity water withdrawals to report the amount of water withdrawn every year. Ninety-five percent of all property owners report their water withdrawals through metering every year, while the other five percent of all property users use estimates. This data, which indicates that six percent of all water withdrawn in 2018 went to agricultural purposes, is compiled into an ArcGIS story map for transparency to all residents in Wisconsin and to aid in a public understanding about water use in the state.

5. *Innovative technology and research are essential to effective water conservation and efficiency strategies:* The literature and our interviews indicated that there are opportunities for improving both the implementation of innovative water conservation technology and information sharing between scientists and government agencies. Expanded collaboration and communication with the state's public universities could allow for new research opportunities and the increased application of new science and technology in pursuit of the state's water conservation and efficiency goals.

   Example: The State of Minnesota's Technical Assistance Program has an internship program that pairs engineering students with businesses to implement new conservation and efficiency measures that apply to water, energy, and waste. This program brings new science and technology to the consumer to support efforts to reduce water use and water loss, and provides students with experience in real world settings.

6. *Reporting and Auditing within voluntary programs can complement existing processes:* Michigan water use regulations administered by EGLE are the primary water conservation and efficiency programs in the state. The process of applying for and receiving a large quantity water use authorization from EGLE imposes limits on water use, and includes recommended voluntary conservation and efficiency measures. With additional resources, including more personnel and budget, EGLE could implement a reporting or even an auditing system that would augment the existing regulations to better track and encourage voluntary conservation practices.

   Example: EGLE's Materials Management Division, Sustainability Section, Energy Services provides grants to various entities for the purpose of energy efficiency. Energy Services then collects data from grantees at the end of a grant related to kilowatt hours saved, reduction in electricity consumption, as well as reduction in water consumption related to the project. These data suggest that water savings go hand-in-hand with energy savings, and the collection of water data as a part of programs in other sectors could be expanded to further understand intersections of water and energy conservation across programs.

   Example: Under Louisiana's Rural Water Energy Conservation Program (LRWA), individual audit visits are performed by field technicians. The LRWA technicians visit water and waste-water treatment plant facilities on a regular basis to evaluate each facility for ways to increase energy efficiency as an integral part of the state's total conservation educational goals. Reinvigorating

Michigan's Retired Engineers Technical Assistance Program and extending resources to the private sector and large consumers would be beneficial.

Funding and Infrastructure

7. *Infusing water conservation into the goals of other programs is an important step in addressing funding challenges*: Insufficient funding at the federal level, and limited staffing at the state level, have meant the state is not able to provide supplemental programming that supports users in implementing voluntary water conservation and efficiency practices. To leverage existing resources, Michigan can infuse water conservation and efficiency goals into overarching climate and sustainability goals and programs. State policy, such as Executive Directive 2020-10 which set a formal goal of achieving carbon neutrality by 2050, creates the opportunity to capitalize on overlap among all the programs that will be involved in achieving carbon neutrality, such as climate, sustainability, energy and water conservation and efficiency programming.

   Example: Several interviewees identified utility-led energy waste reduction programs as a template for effective water conservation and efficiency programs, including the replacement of plumbing fixtures as part of waste reduction efforts. EGLE could partner with utilities to help promote those programs and help the public understand where these programs are available and how they might participate. This would establish a cooperative public-private partnership to promote existing opportunities to the public. The state could also expand the use of these types of programs to accomplish infrastructure improvements, energy savings, and wastewater reduction. For example, a partnership with the state's energy utilities could ensure that contractors, already in homes to conduct energy audits, also address water use and efficiency.

   Example: Technical support programs offered by EGLE (Energy Services) are designed around the best practices of energy management and use tracking tools such as ENERGY STAR Portfolio Manager (ESPM). Part of energy management includes tracking water usage, and ESPM has a section specifically designed for water. Through continued outreach to grantees and stakeholders and the promotion of the use of tools such as ESPM, EGLE can emphasize the connection between energy and water savings to help reinforce this nexus for water and energy users.

8. *The energy-water nexus provides a platform for targeted infrastructure investment:* Michigan's aging water infrastructure impacts both water quality and conservation efforts. A recent study by the Michigan Municipal Association for Utility Issues analyzed energy savings accomplished by addressing water service line leaks. Findings revealed that measurable energy savings can be realized through service line replacements that also address water loss before the meter and therefore not billable to the consumer. Water-energy nexus projects such as these could have tremendous benefits across the state, by providing programs for utilities to perform service-line replacements that save energy, money, and water.

Example: Funding through the MI Clean Water Plan has the opportunity to address and achieve water conservation goals and objectives. Upcoming infrastructure investment opportunities should be explicit about capturing both water efficiency and energy metrics. For example, programs could require documentation of water savings that result from the funded work.

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Appendix - Blinded Interview Transcripts and Written Responses

Interview Label	Response Format
Interview 1	Transcript
Interview 2	Transcript
Interview 3	Transcript
Interview 4	Transcript
Interview 5	Transcript
Interview 6	Transcript
Interview 7	Transcript & Written Response
Interview 8	Transcript
Interview 9	Transcript
Interview 10	Transcript
Interview 11	Transcript
Interview 12	Written Response
Interview 13	Written Response
Interview 14	Written Response
Interview 15*	Transcript not available*
Interview 16	Written Response

*Due to technology issues, we were not able to obtain a transcript for Interview 15

Transcription

Interview 1

0:00:00.0 S1: Yeah. Yeah. Two icons popped up, it might be your audio settings, but I'm not hearing an echo, so it shouldn't be an issue. So my name is Aaron Cohen, a Master's of Urban and Regional Planning candidate in the common School of Architecture and Urban Planning. And I'm Tyler, I'm a dual master's in public policy and an MS and sustainability. Are you filled in and have background information on that project or you'd like us to explain it a bit? [We are] consulting with EGLE's Office of the Great Lakes to identify climate, energy and water programs to help achieve Michigan's water conservation and efficiency goals and objectives established under the Great Lakes St. Lawrence River Basin Water Resources compact by analyzing programs in Michigan and across other US states. Currently, we are assessing Michigan's current climate, energy sustainability and water infrastructure policies and programs to identify specific policies and programs not already reported that [fill] Michigan's compact obligations and identify any gaps.

0:01:32.1 S2: Our team includes folks from the University of Michigan, all team members on this call will have access to the information you provide during the call. We will ask you questions about your current role or job as someone who works with a lot of conservation or an organization that is working on issues related to water conservation. We will ask you about topics that you think are important and should be measured specific to water conservation, water infrastructure and related topics. Your participation in this interview is completely voluntary, and you can stop participation at any time or refuse to answer any question. We will be recording and transcribing the interview. We will summarize findings from this project and [the] report [will] be shared with people working on drinking water affordability across the State of Michigan, and we may publish the results and academic publications. We plan to prepare a report summarizing findings [from] these interviews, which may include illustrative quotations from the last interviews. These data will not be enforced to you or any other interviewee.

0:02:45.8 S2: In the report, we will provide a list of all people interviewed, including position and organization. You can ask questions about this project at any time during the interview as well after the interview by contacting us by email. You can contact Kristina and we'll put her email in the chat. Tyler, you mind doing that? Thank you, Tyler. Do you both agree to those conditions, are you willing to participate, do you have any questions about any of these points, the project generally to this interview, and do we have your permission to proceed with the interview?

0:03:27.7 S1: [Sounds] good to me. Good to go.

Great, so the first question. So we have a list of questions [we sent] to both [of you], [I'm] gonna start with the more general questions leading into a bit more specific, and then it's [in a

review.] So the first question is, which programs [and] policies implemented by your unit agency or organization contribute to water conservation and efficiency in Michigan? So if you have specific ones that you wanna highlight or anything, and we can go down the whole list. Up to you or you're gonna send [reference] to a link. Just so you also are aware... I know Tyler can speak for herself, and sometimes her video camera will go off for WiFi... Internet connection.

Yeah, sorry folks. Terrible connection. But just to clarify, I guess the first goal is to just get a general overview of what you guys are involved in programmatically or administratively, this... I would just add, the goal of these initial interviews is for us to get just a holistic view on what is already going on in Michigan in relation to water conservation and efficiency, so that we can further identify gaps in programming that we can add suggestions to..

0:04:47.0 S1: Right now, it's just kind of what exists and what you guys [are] involved in... That is an existing program. Okay.

0:04:57.2 S2: I can start and [REDACTED] jump in... Correct me as needed or fill in the blanks.

0:05:04.8 S1: I don't know if there's any... Got a pretty bad echo going on for you there, before you get started, I don't know if there's any way that you might be able to fix... I know. We've got the two [REDACTED] on my screen here. Yeah, I A, I don't know. A Reinert helps. Yeah, that goes pretty.

0:05:23.2 S2: Is that any better?

0:05:33.4 S1: And then he just left oops that didn't quite work as well as anticipated or hoped... We'll give him a minute to come back maybe here, and while he's trying to reconnect... I'm not sure how you folks wanna handle it because it's possible that we might have, like if you're asking the same question in both of us that you might get slightly, very different answers that might vary a little bit, so we'll just kind of play it by ear, gonna see how that goes. But while we're waiting for [REDACTED] to come back up, what if you could clear air... And that term used, I think it was drinking water potability. I had never heard that one before. What did you mean by that? Drinking Water, portability in a question. I believe there was... You will summarize findings in this project in a report that will be shared with people working on drinking water affordability across the State of Michigan and may publish. Yeah, trying to get used to both listening and then of course, I'm distracted by the closed capturing down below there, and it put up portability and was like... Is that what he really said?

I think I can turn it off and it's still gonna record...

0:07:02.1 S1: That's what I think. But if it becomes too much of a distraction, I'll turn it off.

No, I think it'll be fine. It kind of send portability also, so I was curious about that, but affordability makes much more sense.

0:07:19.6 S2: Is my co-problem? Been solved.

0:07:24.9 S1: It is at my end. Yep, sounds good.

0:07:28.4 S2: Okay. Well, from a big picture perspective, part 327 Great Lake preservation is Michigan statute to administer the Compact, so that includes some of the requirements related to water conservation, when we authorize a... When we do a specific review authorization, we back up Michigan, it has an online water withdrawal...

0:08:32.5 S1: Yeah, I'm guessing that [REDACTED] is totally frozen for everyone else also, that's what I'm seeing in my end... Yeah, there. Okay.

0:08:48.0 S2: I don't know what have...

0:08:58.8 S1: I might try and try and stop my video all, so they might all have to try and do that if the connection is just not keeping up with us here. So I'm gonna try this same thing just to see if it works E... Alright, [REDACTED], so now you're on mute if you wanna try and get and see if it'll come through otherwise you've been pretty frozen stuck.

0:09:50.9 S2: Yeah, I apologize, I'm having some internet VPN issues here, so why don't you go ahead and... And I'll try to reconnect and join in...

0:10:05.4 S1: Okay, that sounds good. I was probably not gonna go as far back as you had started there [REDACTED], looking at the question, which programs and policies implemented by your unit contribute to water conservation and efficiency in Michigan? I was gonna be a little more efficient and conservative in words here too, so my response to that would be Michigan Water Use regulations administered by EGLE, that would be my unit, and [REDACTED] unit here are the most significant contributor to water conservation and efficiency, albeit indirectly, so the regulations that we have imposed limits on new water withdrawals, which are meant to preserve and protect water resources, but this is, as I say, it's an indirect... We don't really have programs and policies that contribute terribly much to water conservation and efficiency... We do have regulations, and these regulations have limits that can force a new water user or the property owner where a new water withdrawal is going to be can force that user to consider more efficient water use methods, basically to reduce their impact on water resources in order to get their new withdraw authorized, so in order to begin making that withdrawal, they've gotta meet these environmental impact limits before they can even get it started, so it kind of for can sometimes not always, but it can force them to consider more efficient uses or more conservation in terms the total rate or volume water that they're using, so on top of that regulation that has the authorization process, whether it's getting withdraw, registered or permitted after that step, then all water users or large quantity water users are required to report annual water use and in doing so, and they're submitting these annual reports, they're also required to review basically generally accepted water conservation measures that might be specific to their own water sector, so an industrial or manufacturing or irrigation of some of those broad, broad sector delineation there, but they're required to review these generally

accepted as the best term that Vermont use in powering that from agricultural irrigation that uses...

0:12:52.2 S1: Amps are generally accepted air cultural management practices. So I'm using this term generally accepted water conservation measures, which had been submitted to the state by different industry or water sector representatives. So when they're submitting those annual waters reports, they're required to review those conservation measures, although I will say It's pretty much a complete unknown, just how much this annual review of the water conservation measures might even be... May or may not be even contributing to water conservation practices, that's kind of my answer to that first question I see into what...

0:13:40.1 S2: And you said... What I was roundabouts getting to was, we do require self-certification from the property or that they are following water conservation methods, both for... When we authorize his zone C, meaning that it's approaching by night and at the point where an averse resource impact is likely, but also when they submit their annual water use reports, again, they're required to self-certify that they're following either generic water conservation methods for their particular a sector or that they are applying specific water conservation methods also for a permit under Part 327, which is for larger wood draws over 2 million calls a day. In the statute were, one of the decision criteria is reviewing their wire conservation methods and try to make sure that the Woodrow is efficient. It's waters possible.

0:15:01.0 S1: So yeah, there's a slight distinction that I wanna make here between those water withdrawal permits and these registrations that might be in one of those zones, see watersheds that you may be completely unfamiliar with there, but... Yeah, so I do mention that one came year, the area the water set is approaching adverse resource impact Limits, in those cases, those registrants, those water users registering his own sea water withdrawal, they're not required to certify that they are implementing water conservation measures that... That's a bit of an overstatement. So they're only required to consider them... Michigan, Michigan's law is pretty weak on that front, the water withdrawal permit application, actual permit that's required for basically the largest of the large withdrawal of any withdrawal that might be 2 million gallon per day or greater capacity, those in a permanent application for one of those large withdrawals, they are required to certify that they're implementing water conservation measures, but it's a difference between the permit application permits and the registration, which are not required to certify, they're implementing them. Send you so much, but for your responses, one follow-up question I had on the sales certification, is that a check box that they have to go through to make sure they're doing certain things, and they check out cesena, we've done that.

0:16:41.8 S1: Even that, or what does that self-certification entail?

0:16:49.8 S2: Yeah, basically for his once authorization is essentially we send the checklist to them and then they... They check off which methods they are following in the end, you wanna talk about the Water Use Reporting... Yep.

0:17:11.9 S1: Yep, sure thing. And then just to follow up on that checklist again, because of the kind of the week low that Mian maybe has on this front, those registers, the... They're perfectly in compliance and law to check no boxes and just... They can just say, I've considered them, but I'm not implementing any of these up, and then what are you reporting that... That certification is not a check list, it's just... We just direct them to the water conservation measures that are generally accepted water conservation matters, we just direct them to them and to the measure them, and then they just sign by their signature, their signature, or checking the box on an electronic report that many of them do so there's not an actual signature, there is just sort of a check the box which comes with their electronic signature that they have considered... They've reviewed and have considered implementing these conservation measures, and then on the permit they're signing to those full-blown Jugal precast permit applications, they just... When they sign that permanent equation, they are a testing that they will implement, and we don't use a checklist in that form there, we just say, We just have them refer to the conservation measures and just say they're required to inclement.

0:18:40.5 S1: Basically, all of them, although there's not really an audit process or anything that we've gone through, they just certified they're implementing these water conservation measures, which implies... All of them. Thank you so much for that. And I think you've kind of answered the second question already or... Just parts of it. The second question, which programs policies implemented by our unit agency, by your unit, do you believe our most effective in supporting water conservation and... Or efficiency in Michigan.

0:19:16.9 S2: And in your response to the last question, I restore don't have programs that you have, the permit and the registration, would you say... Would you agree with that? I think most of the games and water conservation efficiencies that the program has achieved to date have been more indirect, an example would be a state-specific review in a depleted water management area, where we're negotiating project modifications with the property owner, they might look at what adjusting their water use, and see if there's a way that, if we can find a way to modify their propose would draw to meet both their water needs and a boy causing the Evers impact. In some instances that might include looking at their irrigation methods, for example, maybe switching from spray irrigation to derogation, we've had some SSRS where we'd like to gotten down into the weeds to the point of looking at return flow characteristics, so return flow being the amount of the water is applied that actually infiltrates back down to the water table, so looking at what methods can they modify to increase the return flow? Would you mind defining SSRS specific review? That's where e eagle staff are all available information about the withdrawal and the location warships located, and then we make a decision about Are they likely to cost or resource impact or not, if we feel they're not, then we can go ahead and authorize there withdraw.

0:21:39.6 S2: Either as proposed or if we can't, authorised negotiated a modified project, like I said, meets their needs and avoids causing the Evers impact.

0:21:58.5 S1: Yep. And just to echo that, I agree is basically the same thing that [REDACTED} just said there, Aaron. Yep, I would agree that that question had been answered basically by the

answer to number one, so that our Michigan's Water withdrawal regulations all be indirectly, are the most effective in supporting water conservation. And of course, a part of that reason being that there really are no other programs or policies in our unit either list or are effective, so leading into the third question, there's much more general question, China's a whole... Are there any areas where you feel that Michigan has excelled in terms of water conservation and efficiency, where do you think improvements could be made...

0:22:50.0 S2: Howser is... I don't think we've excelled anywhere, given, given the status of the way the statute is written and all things you could say that We've excelled the water conservation and efficiency. So there are a number of various were improvements could be meaning, how likely those are, is a subject subject to debate. Some states require metering. Withdrawals, Michigan does not. They could... For very large withdrawal, if they were to apply for a permit, they might propose metering as part of their water conservation measures or a way to prevent an averse impact, but in the industrial water use sector is more used to earring and a lot of the other water use sectors are... So that would be one area for improvement... Another area where it could be improved would be to switch from strictly voluntary and certification to a more mandated set of requirements, now whether that's clerical feasible or not, it's open to debate.

0:24:22.8 S1: And I would agree with what you mentioned there also... The only thing I'd add to it perhaps would be that there are a number of industrial water users, maybe individual specific water users that have made efficiency games maybe from changing there, it could even just be their corporate philosophy. We're obviously seeing that kind of cultural shift towards more conservation or environmental protection type ideals, so changing corporate for a lot of philosophies, we've seen that... Or maybe just borrowing these philosophies from national water use policies, where it's something more of a just a... I think a mental Ural change that's kind of tending towards acknowledging water shortages in other places, we might not have it here in Michigan at this time, but just seeing it out, we're just so much more aware of these days of what's happening regionally, nationally, globally, or what have you... So I think that's kind of driven some of these individual water users or corporations to a more conservation-minded approach, so other improvements that might be able to be made is probably just in a public outreach or public education efforts that the state or our particular unit here and in the state government might be able to do...

0:25:57.0 S1: Up until this point, we certainly probably haven't had much extra man hours available to dedicate towards that, and there certainly hasn't been much of a push or an impetus from the legislature from funding sources that might give us the time to do that. It hasn't been a big priority up unto this point... I would say that it hasn't been driven by Michigan government. I don't think so, not from our perspective, but Jameson are... Agricultural irrigation has made quite a few, maybe smaller, but incremental improvements in water use, efficiency or conservation, primarily through the promotion of Extension agents, so MSU extension or any other USDA partners with agriculture there that are seated in each one of the colitis in the state. And so promotion of the camp program that Generally Accepted Agricultural Management practices program to be environmentally, a short farm... I forget exactly the terms

that they used on that, but it's sort of a feather in the cap that some farms are interested in pursuing, and in order to do that, they've gotta adhere to these conservation practices, which are fairly not real strict or stringent, but it is something out there, it's sort of a little bit of an incentive for some farm to do and they're getting some good direction, maybe from our Extension agents or other agricultural industry partners that are steering them towards more water conservation practices.

0:27:51.3 S1: So thank you for your response, and then I think you also partner, the next question, which is what sectors and our stakeholders do you work with to implement or create programs, and it sounds that the agriculture, specifically the agriculture irrigation sector is a big partner or someone that you work with

0:28:16.2 S2: A... Irrigation is responsible for at least 90%, if not more, of our large quality withdrawal registrations in Michigan are for Ag irrigation. So some of the stakeholders that we work with, Farm Bureau, MSU extension, the MSU researchers, as we've partnered with some of the irrigation equipment suppliers that hold workshops around the state, so partnering with them for education and outreach opportunities...

0:29:08.9 S1: Yes, and then probably just a little bit more recent emerging work that I think is how I've got you here today. Basically, Aaron and Tyler is some of the water use advisory council committee work that's just sort of in its infancy a little bit here, but basically just pull into that water use Advisory Council and the committee members that we have working on water conservation, you're pulling together some other stakeholders from the Michigan Chamber of Commerce, and of course, the State Government water policy representatives, in addition to the water regulation representatives, which might be me on that committee for instance, but we also have State Government water policy representatives that participate from... Also from the same department in Eagle, or occasionally from DNR, also there's a water policy specialist in DNR, Department of Natural Resources that participates sometimes also. So yeah, we've got just sort of that emerging work that's going on, water supply utilities or electric power generation utilities, that's also some stakeholders that are active in this water use advisory counsel and water come Region Committee to the Consuls. I think the answer part... The next question as well, what sectors do you think have the RAs potential for improving conservation and efficiency, and how does your unit work towards making improvements in these areas? Larger irrigation is 90%.

0:30:56.0 S1: Everything that's a big part to make improvements or games, and it sounds like utility might be an emerging sector due to the committee and the Michigan Chamber of Commerce for relationships between different organizations.

0:31:13.6 S2: Would you... In terms of share, Vim of water used, the utilities are by far the biggest sector, but then when you switch it around, look at consumptive use or the number of registrations that aggregation is the leading sector. So we work with... Well, through the water use Advisory Council, they have their water conservation and efficiency work group, but we will also partner with anyone that will partner with us as far as education and outreach, but proven

examples would be Farm Bureau, MSU extension, some of the ag irrigation suppliers. We've also partnered with our drinking water division, and you go with local environmental health departments in some of their conferences.

0:32:18.7 S1: Yes, and I had added that honestly, one sector that that might have the greatest potential, it might not end up being the greatest gains in terms of water, conserved gallons or what have you, but one sector would, honestly, I'd probably be domestic water use. I think that it's not an area that we work with because the state regulations, the state government is strictly directed towards large quantity water withdrawal for these numerous, but smaller quantity water withdrawals for domestic aureus is not something that we have a chance to work with much at all but I honestly think that's probably where one area of the greatest potential might be in somehow through public education, public outreach, getting more of this word out about water conservation practices and ways that individual home owners might do a better job concerning water. And yeomen, certainly agriculture irrigation, even small gains there can add it quite a bit because of the overall impact that you have in the torus to do an electric power generation, clearly, very small changes in their consumptive water use rate, which I don't fully understand that we get that information reported to us each year, but it does vary, even an individual power plant at generator power plant might...

0:33:50.7 S1: Their consumptive water use rate varies a little bit from here to hear, and like I say, I don't understand all the reason why and have really fully investigated, but a small change and their consume degree can make a huge difference because of the volume water they are running through the plant and so forth. But yeah, I think primarily the way that our units are in state government works is just more or less through imposing the Water Use regulations we've got from the legislature.

0:34:24.5 S2: Another sector that we might be able to make improvements with. I don't know how big the improvements would be, interns able... Fines would be non-Ag irrigation. So golf courses would be one example, but also landscape irrigation, and they have the golf courses to have representatives on the water use advisory council, not so much for landscape irrigation, but simple. One example might be, what time of day do they apply the turnpikes on Marsala, scape, irrigation the... Like a golf course, but that makes a lot of sense, and it ties it right into very trias addressed and touched on is how our agility and not utility consume AUs is tracked. And then reported to the state. Are there consumptive uses that are not track well, are there opportunities to make improvements and tracking and reporting on some... Ouse sounds like domestic water use consumption is an area that is not tracked well, or he's not reported Armas to You, and it sounds that golf courses and landscape initio... There's the areas to improve, someone consume a use there as well, and irrigation in terms of the return, the return flows and some of their water balances, some of the operations are quite scientific and they have a pretty good handle on the water budgets, but others...

0:36:30.0 S2: You get the water used reports from them, and if there's any information at all about the return flow volumes, it's custome. So continuing on, what challenges or issues have your unit faced when implementing water conservation and our efficiency programs and

policies, and how are you overcoming these challenges to touch on some responses from previous questions? It's indirect. So a challenge is that there's not a lot of regulatory statute there for you to lean on, we try, to the extent we can, we try to address that through education and outreach and collaborating with some of the stakeholder groups in guard and Durand, Rickie division as examples. We've been able to do more in the last few years as we've added staff to the program, and the early days of the program, we were very under-staffed and had our hands full, simply... We're trying to... Is a site-specific reviews, permit reviews. Authorizing withdrawal or did have time and worry about water conservation and efficiency...

0:38:11.8 S1: As a follow-up question to cuisine, you were authorizing with corals and there's DaVita tool, does that to incorporate single use of this is drawing what is asking and when you're making the consideration, are you able to give time to consumptive use it there? I'm not gonna use the ritornello of a zone or an area. Are you able to take five withdrawals in the area into consideration before proving that six withdrawal or is it everything pretty site-specific? We

0:38:50.9 S2: Do track both through the tool and our same specific review authorizations, we are tracking cumulative stream flow depletion on a sub-watershed basis. So if you think of it like a checkbook balance, we're topline authorizes withdrawals or debits, is registrations expire or there are other changes, her credits back to the balance, and likely, I'm still a part of the generation that now recheck book is...

0:39:31.9 S1: And the same line, what are individual motivations and incentives with in the sectors unit works with that drive water conservation and efficiency, there was a reference to the checklist that gets sent to them, and sexes and farmers are given a list that they can work towards. Is there anything else that you can think of that provides incentives for water conservation and efficiency, trying to reduce their water and energy cost is a big driving factor. So I just kind of following along here, so we're kinda working more or less, question number six, what you had there, and that's exactly the same answer that I had was the energy cost savings is the primary driver motivation incentive that we see for folks, just the cost of moving water around in all its various steps of that process of moving it, ether one is a public perception and image, this kind of goes with what I mentioned earlier with the cultural shift and change towards maybe more of a protective and conservation-minded approach to environmental protection, and so you've got that corporate philosophy that some folks might want to change and keep up with this basis consumer demand in a lot of ways that are seeking out companies that are showing this responsibility or what have you, this response to the cultural shift.

0:41:22.1 S1: And so they wanna keep a good public perception and image, that's also certainly a driver that we've seen, I think... And I don't wanna wanna back up real quick, I think we might have skipped a head when you were talking about the challenges, their issues that our units faced, and mentioned the legislation, how that's obviously got our hands tied in some ways, but one other thought that I had on that. Right now, the biggest challenge that really have is a wet weather cycle that Michigan's been in for 70 years, honestly, crisis is what pretty much drives change, that's basic human nature that we don't see a whole lot of variants from a lot of times, but... So we're in there. It's waning now, I think. I believe that we're kind of in this extremely

wet weather period that's perhaps coming to an end now and showing signs of that, but certainly not what it was for the previous seven years where we kinda basically had the widest at a six to seven years that the state has ever recorded... Ever in history of 120 years or so. So yeah, our crisis right now is too much water in a lot of places, which doesn't need one to water conservation very naturally.

0:42:38.4 S1: So that's one big challenge we've honestly got right now is just no motivation and incentive to conserve water when we just have too much going around right now in some people's minds, so... Alright, and that's sort... For the next pension, what opportunities do you see? No energy climate in the water or fiance and programs to advance water conservation in Michigan. It seems that with the large increase in tears, an increase in education of water conservation is a big opportunity to conserve down the load, cheating importance, even though you can see it, and you know there's a lot... That would be a big opportunity, but I'm sure there might be some more you'd like to add a... Yeah, I'll jump in all, [REDACTED], maybe thinking on that one, but this one comes back again to me is for energy cost savings to reduce your carbon footprint, and obviously, in a way, we're still largely carbon-based energy production here in the state. So that's one thing that folks are looking to do, reduce that carbon footprint, reduce their energy cost, of course, they've saved money that way, and to maybe a lesser extent, for the reasons we've already mentioned your water footprint, that concept obviously also is not something that's got a whole huge amount of traction here in Michigan to try and reduce your water footprint, but I think it's probably the primary or the strongest opportunity would be just a desire to reduce that footprint in all ways on our resources, and then of course, to save on energy costs.

0:44:53.2 S1: So when we introduced this concept early about the water withdrawal assessment that we do in the zones of withdrawal, how they might be rated and as you approach an adverse resource impact, it's helpful to keep in mind if you haven't... Maybe I already figured that out. You probably have, and I apologize for going back over it, but what I've got is basically a legally available amount of water, which is different from the actual amount of water that's out there, you've got a legally available to water. So if we do continue to have... And that legally available water is not really subject to short-term changes where I might be in a wet period for a few years, that legally available mono water is not really subjects change on a quick turn around, it's gonna have to take a long-term change before we see the legally available in Mount water be changed in one way or another, so once we run up against these legally available water shortages that are obviously imposed by the regulations, then that's gonna be... It's gonna be a very prominent driver of water conservation practices, there's really no other direction this can go in terms of new water withdrawals that continue to be added around the state, you're just obviously Nick in a way, taking little pieces of the available pie and that legally available water that just continues to trend downward, it can't really reverse too much at all without going gory details there can't...

0:46:27.6 S1: Belabor is too much. So we just kinda always are trending down towards this, this limit, this hard limit that's imposed by the statute law that puts a legally available legally available limit on the water, and that's gonna be a primary driver in the future... There is an

untested there, in part 3-27 makes provisions for what's called a Water User committee, which the theory behind it is to, on a sub-warships, let the local users locally, wires morgent government, get together and try to manage their water resources on the local scale. 12 years into the program that one water user, CONUS informed yet

0:47:21.2 S2: Were use Advisory Council has another group looking into doing some research about, Okay, what are the barriers to form in the fire user committees and publishing a guide to help groups form. But one of the potential areas is the gap between the authorized water volume and amount owed that sexually used. So in some cases, there may be a gap where they're authorized to use a lot more water than what they actually use, and were case scenario, so there might be the driving force in a bare user community is to try to provide a means to stay out of court and adjust things on the local level to stay off court, so that might provide some area for flexibility to work out agreements amongst themselves, but the more people you marwar us you have, the harder it is to get them and agree on anything. So I'm tested theory. Another driving force for future games would be some of the research that's going on at the university levels, and a fee, for example, I've seen some papers where they're doing some experimentation with putting some kind of impermeable liner to below the ribs on the crops to try to keep more water within the rione and increase the efficiency of making water available for uptake by the crops.

0:49:07.4 S2: So some of... Some gave his research on the universities and in trying to make a practical and get it out there actually in use... We're wrapping up getting towards the end, I lead into some late question, what do you see as gaps or opportunities for further water conservation programming with or outside your current program area? A

0:49:46.4 S1: Mr. Mill, and you just touch there, but on university research and academic... Practical academic research, but there's any other departments or areas in... Or outside here you

0:50:09.9 S2: Side... One example I can figure outside of our current program area would be on the basin scale, through the Compact, some of the wire, the Compact Council, the regional bodies, some of the representatives of the states and provinces, they get together and What are the focus areas they've identified is water conservation and efficiency? So we may be able to look what other states and provinces and the region are doing and see if we can learn from what they're doing.

0:51:00.1 S1: Yep, and I come back to you, unfortunately, that the lack of a crisis is probably just gonna sustain our gap and reaching... That's just my opinion, I suppose. But the lack of any kind of a water crisis here in Michigan is gonna continue to sustain that gap is in terms of reaching further water conservation, it's gonna make it... It's gonna continue to be a challenge. I think if we return to some kind of a dry dry weather cycle, then that sort of wines back up and its prominence to where we might start thinking a water conservation more overall here. However, as I mentioned before, social media basically, if you think about it just in that type of term, it's just led to such a globalization I think of thought and people's awareness is just so

much more easy and available for people to pick up on different things that are happening elsewhere. So thinking more globally, shifting that cultural interest, like I mentioned, and I think that's gonna continue... My guess is that's gonna continue to chip away at basically what we have is our old old fashioned or all the attitudes of indifference, just because it's not a problem right here, right here in my backyard.

0:52:21.4 S1: Then it must not be a problem anywhere that... I think that that's sort of... Obviously, I'm not talking bad about older generations, what have you... Just that, that's just how it worked. You just were as aware now it's easier to be aware, and so I think that will chip away, so that's an opportunity is basically just to exploit social media in one way, or just more information out there about what are challenges that are being seen elsewhere and how it could see climate change or something like that, how that could start to creep and do... Even you are about own backyard at some point.

0:53:03.3 S2: We made... There are some regional problems within Michigan where some of these issues may come to my head, central automaton is the most prominent example I can think of where... Because of over-pumping in the better Adcock for their drawing in Brian's from deeper in the formation and impacting the water quality to the point where it's damaging the crops, so they can't use deep vertical wells for the wire, they have to rely on horizontal wells or direct surface water withdrawals for the irrigation. So those... And then at the same time, you've got competing wire demands for residential subdivisions wanna go in and other water users, so some pinch points like that may be driving forces behind future innovations.

0:54:04.3 S1: Right, yeah, that's a great point. Scare basically between Grand Rapids and Holland, that has seen a tremendous growth and population kind of development, residential developments out there, and most of the water used trouble that they're running into, so most of the water use, it has been those smaller domestic... Withdrawals in high density residential developments for the... Each and every one of them has a well at their house, or however it might work, even the community water supply system that might serve a sub-division or a city or what have you, there you... If there aren't too many in that area that are unwell, if the community wattage plies are taken off of the Michigan supply, Lake Michigan pipeline and water that Grand Rapids uses. But primarily, the source of that problem has been not so much the agriculture, your gate in which there is a lot of... But I think the source of the problem or the culprit has been more just that high density residential moment in each one of their small individual water uses that add up into something areas wanting, where we do have basically a crisis right now at this moment, that's a great point to finding down...

0:55:29.5 S1: We kinda stay earlier. Are there any white papers or publications in relation to the programs that we discussed that we should read... Mr. Mayo mentioned the liner that is being worked at MSU, and that sounds interesting, and to follow up on is any other white papers or technology that you've seen that if we follow up upon.

0:55:57.3 S2: Michigan State has the central auto county study that they've been doing deals... We care for me. So has been involved, but also at the county level, like Paul sax, and who's the

guy on the council from Ottawa County past the SCADA has the shoves, they've been active in that area servicing on that. Steve Miller retired from MSU. So I'm not sure who's carrying out some of the research there...

0:56:44.7 S1: Yeah, I'm not really aware of any white papers, any technical reports like that related to innovations perhaps, and water conservation, so even some of the study that's been done and it Conway did not come out of that, was a great solution other than use less water. Right. So yeah, it didn't come up to that point to have, here's some potential innovative solutions to this problem, it was still just more of an identification, let folks know why and how it's occurring and what's led to it, so yeah, I'm... Unfortunately, I'm not familiar with really any white papers, anything along those lines that might be helpful for you, do you have any contacts that could provide more perspective on a topics we discussed?

0:57:34.5 S2: There was someone you mentioned on the counsel from representing Ottawa County who might be a good resource and a past sheets, I'd have to email you the spelling of his last name, but he's representing the Aww, the wearers association, but he works for auto accounting. So he would be one of the people, Dave snow retired from MSU, but he's still active on the council... At the council meetings, the MSU extension lending, Kelly would be a good contact, a point towards some of the research out there. Well, our final question is what questions should we have asked that we didn't kind of thoughts that came to your mind that I didn't take quite cover that, but on the friend or some questions... We sort of touched on this, the way itchiness talking about really crises are driving developments in water use as program and water conservation in Michigan, and we've taken the approach to... We're not like some other states where they have set a limit for what years and then have another married level for dry years. We don't do that in Michigan, or when we're authorizing wares from you telling the water users, okay, look at drogo 2012 what is...

0:59:52.5 S2: Try to anticipate your worst case water needs and see if we can accommodate those, and then if we can accommodate it, the worst case, then we should be okay, and if we can't, then the scenario where we're gonna have to look at modifying to see, Okay, how can we meet your needs and the podcast it an impact.

1:00:29.8 S1: Yeah, I didn't come up with any great questions that you didn't ask me, that was a tough one for me, I appreciate that much challenge me and I failed that out, but I did wonder more about... Basically, question number, the question 13 there on my list here I'm looking at... So you'd mentioned about consumptive water use, and I wanted to clarify whether you are on the same page that when my mind thinks about consumptive water use and so forth, 'cause IT asked how it was tracked and report of the states, and so... Yeah, in my mind, there's definitely two different things, and [REDACTED] touched lions earlier, also you've got total water use, which just means you're moving water, you're pumping it, you're doing something with it, even if it might be something completely innocuous and putting it right back... Right. And then there's consumptive at us in our minds, and our definition consumptive means that the portion of their water use, the portion of your total wants that's not returning to the local system, so it's either evaporated the primary means or incorporate into a product or shipped away in

containers or whatever it might be, for some reason that water is not coming back, even through a wastewater stream, or we just want a return flow stream, what have you.

1:01:50.9 S1: It's not coming back at all. As far as in terms of reasonable time scale, it's not going back to the region, obviously, we don't lose water in the state unless it's pumps down into deep confined those... The injection will take things, those are pretty much lost, but... But the TA that we don't lose it globally, but yeah, so our waters are required to report consumptive use, that's in the statute, but for years, folks have struggled to comprehend basically that same seemingly simple concept that they just talked about, Well is the portion of water that's evaporated, lost or not going back locally, and they still really struggle with that, certainly many other water users don't have any need or maybe interest or what have you, to measure their consumptive use. It should be sort of relatively easy to derive, and so that's what we end up doing is years ago, we changed the way that we asked for that consumable, instead of asking for folks, what's your consumptive use? We ask them two things, what's your water use and what's your consumptive use, instead of asked them that second question, we just ask them for... Of the one that you withdraw or use, how much do you discharge locally, so you could just do the math and subtract be from a there and you should get your consumptive use and...

1:03:12.5 S1: So that's been better, that's helped us to better get consumptive use information from water users are they still kind of tend to mess it up a little bit, but yeah, so if there is an interest or a way to improve our consumptive use measurement basically. And I think it would just be right down almost to the individual level, individual facility, like do a better job tracking your consumed abuse may not be too hard, but it's gonna vary from each site to site on how to do that for irrigation consumptive use. It's very difficult to measure almost impossible for that sector I wanna use, and actually for almost all of them, all of them, except for electrical, power generation, all the other water use sectors, we just resort to using these industry except generally accepted. Consumptive use, co-efficient, so we just assign it. It's 10% consumptive use and industrial water use, and that's across the board, just a gross understatement of the complexity of how many different types of industrial water uses there might be, but still, that's the number we use 10% is the consumers coefficient on industrial water use. So there's certainly plenty of opportunities to better track that we might be lacking much incentive right now for utilities to really do that, to throw much of their time, money or effort towards it, but that's one question I wanted to clarify from you, if that's what...

1:04:49.3 S1: Exactly what you meant by the consultants and then... Yeah, I just kinda throw in that we don't track it too well right now, and in order to do a better job at that, it would require a pretty intensive sort of effort to get right down to the level of maybe individual water users because of the different processes they might use for water, for how they would go about tracking their consult AUS. Yes, that is what I'm in. Thank you for that explanation. I wanna be wary in cognitive, your time and schedule. I wanna go the operator, Tyler, or anything else that you wanted to add or say? This

1:05:41.3 S2: Is a rate really can't hear you. It's coming in as high pitched noise, if you have a

question, you can... No worries. You can write in the chat. Yes, thank you both for taking the time. It is very much appreciated and freesat or conservation with us. So you're walking. It was talking with you.

1:06:14.5 S1: So with that, I hope you have a good rest of your day and I hear in restore week and I'm going to stop the recording. Okay, very good. Thanks to other things, Erin.

Transcription

Interview 2

0:00:02.5 S1: Alright. Okay, so I'm gonna read the consent statement, and then we can go ahead and ask some questions. Okay, so alright, before we again, I need to go over some of you major points as required by our research board, so our team includes folks from the University of Michigan, all team members on this call will have access to the information you provide during the call, we'll ask you questions about your current role or job as someone who works with water conservation and or an organization that is working on issues related to our conservation, we'll ask you about topics that you think are important and should be measured specific to water conservation, water infrastructure, and related topics, your participation in this interview is completely voluntary, and you can stop participation at any time, or if you use to answer any question, we'll be recording and transcribing this interview, we will then summarize findings from this project in a report that will be shared with people working on drinking water for ability protested, Michigan, and we may publish a result in academic publications, we also plan to prepare report summarizing findings from these interviews, which may include a lecture of quotations from the interviews, these data will not be linked or attributed to you or any other interview me, but in their report, we will provide a list of all the people interviewed, including name, position and organization, you can ask any questions about this project at any time during the interview, as well as after...

0:01:24.2 S1: By contact, via email. So do you have any questions about these points or... Generally about the interview.

0:01:31.0 S2: No questions. Thank you for reading that.

0:01:33.3 S1: Great, and do we have your consent to... Move forward, you do. Awesome. Okay, so we'll just get started. So just overall, which programs or policies implemented your unit contribute to water conservation and efficiency in Michigan?

0:01:51.0 S2: Well, the primary intersection with water conservation has to do with our state energy program, energy efficiency resource dollars, and under the direction of Robert Jackson, and with the support of DOE, we have begun looking at how we can use the dollars that we have access to to support water efficiency, we did pilot some work, I want to say last year, pandemic has blurred by my years, but I think we started actually prior to last year or so in

2019, trying to find the intersection between our water efficiency dollars and some of the work that then... Director of the office of drinking water public advocate in Isaias working on and finding some money to support infrastructure needs at the residential level across the state of Michigan. So although the Office of climate and energy doesn't have... We haven't developed anything new as a concern or conservation, the bulk of what we have implemented lands in our state energy program dollars with efficiency now on the climate side, that is both a understood resource need at the infrastructure level who are looking at less conservation and more how do we manage impending on slacks of increased storm water and our infrastructure and how that's managing cities, so that's known, but then there's a piece of it that's kind of a moving target of how do we best support a resident around the state, primarily, we've been focusing our attention to local governments and community organizations through Catalyst communities, and right now that work is at the education level, so education and awareness building that amongst different stakeholders across the state, so that they know that the state has different resources, and in terms of thinking about water conservation, thinking about what that means by mid-century and also just making sure that we are considering that we have our Great Lakes and we have a lot of different aquifers around the state as we think about climate, so it's very educational, very preliminary.

0:04:40.7 S2: Where we have been trying to go... And again, these are less foreign policies or programs, where we're trying to go is to push on folks to build capacity with studying our water resources or aquifers, just getting updated maps of where they are and how they're changing, being able to get that data... Aggravate aggregated in a meaningful way, so it's more at this really foundational steps of, Okay, we have climate and water, and what is the relationship there? We have an idea of what that relationship is from the IPCC and what they're telling us to think about, but now in order to get action on it, we have to build the reservoir of data resources that support how that's playing out in Michigan to always justify some increased attention or spend, so that is... A lot of those things aren't really tangible outside of discussions and areas that we're investigating, but that's kind of the overall direction.

0:05:53.6 S1: Great, and which, if anything that you're hardly implementing, do you believe is the most effective and promoting water conservation efficiency? So

0:06:08.0 S2: In like a lot of areas for de-organization, awareness is really key that people know that there's still more that you can typically do in your facility or your home to conserve water. A lot of folks don't know about it, and if they know about it, they don't know the nuts and bolts, they kind of think of it as a concept. So building awareness and that motivation for pursuing water conservation at all times, and then the other piece that occurs across efficiency is access to efficiency implementation. So we have really good tools on inefficiency to reduce water usage or conserve water, and you just like any other resource, use it much more effectively. But for wishes of the population, unless you are building a new home, unless you have access to resources to retrofit your current home, if we think about it at a community scale, if your water processing facility does not have the tax base to implement certain measures, the water efficiency can be inaccessible barrier, the primary barrier after everyone's aware that this needs to be done is broadcast Al... Support to move these projects forward. And there's a whole

bunch of different proms that come up in my mind when I think about access, so it's first money after where it is, then you need the money, but then you also need to work for it, so who's gonna be implementing these measures, who's gonna be leading the project that our contractor base is...

0:08:11.0 S2: Our contractor base ready at a broad scale to be able to implement water efficiency measures across the board and educate on water efficiency measures, so for a foster air later that sometimes when we go into homes and we're putting in those arrears on the facet, it can look like an additional weird thing and folks pull them off, so unless people understand why that weird little thing is important or a different shower head is important, it can create obstacles for us...

0:08:50.9 S1: I don't have the meeting. I knew you're not a mushy.

0:08:55.2 S2: Gotta click in where it was before... I'm so sorry there

0:09:04.3 S1: Two of us in the house having Zoom meetings right now, and she's having issues with the computers, I forgot to move my microphone, I apologize to it.

0:09:12.8 S2: No worries. We all do it

0:09:20.4 S1: All. Great, so you're talking about education and just knowledge of education and access, kreator, there any areas where you feel Michigan has excelled in terms of water conservation and efficiency, and on the flip side of that, are there areas we think improvements could be made...

0:09:48.4 S2: The area that I know most about intersect with energy, so that is conservation when it comes to energy waste reduction programs that are offered through the MPs, the Michigan Public Service Commission, so through those utility run programs, process state, there is a constant flow of education on water efficiency measures, it is one of the... I forget what we call it, but it's like a measure that you offer a customer to get your foot in the door to say, Hey, we can save you money on your water bill, so I think we do a really good job about getting at the base level what in the rest... My answer, I wanna turn it to adaptation and broad-scale water conservation, when we're thinking about the changes we expect to see in Michigan in increased increased porosity and frequency of storms that... There is a lot of opportunity for us to think about what that means in Michigan, a place that seen as having a ton of access to fresh water and how we begin to mold that into being good stewards of our water overall, even though we tend to think about Great Lakes. So we're here, we tend to think about lakes and streams over here, you're thinking...

0:11:25.3 S2: We mean the average Michigan, we don't connect our large bodies of water with the rain that we're gonna see coming down with how we are intersecting in our environment, so I think there's more that can be done on the conservation side. And again, this is kind of out there, but there's more that can be done on the conservation side when we think about what

water you're coming into contact with and how we relate to that water, and then how it feeds back or doesn't into our overall system of conservation. So right now, I don't see... From where I said, I'm not seeing a bridge from our traditional programs of energy waste reduction and efficiency, it's more about our use and our demand and supply less about, okay, there's good and bad with having an over-abundance of water, how are we interacting with that to feedback into our system of conservation, and so it's a very un-baked thought, but that's what I see is missing.

0:12:38.2 S1: Yeah, thank you for that. And I wanna go back, you mentioned that your contractors are the ones that are implementing programs, so can you talk a little bit more about that and just what other stakeholders you've worked with to implement or create programs or initiatives... So

0:12:55.5 S2: If we look at our energy waste reduction programs, and this is true for most energy efficiency programs across the United States. The utilities run the programs based on rapier dollars, and then essentially contractors who are... It could be your HR specialist, I could be your electrician, whoever is typically listed on the tides website or... It's broader than that, but they'll have a list of trusted key contractors and apologies, my dad is coming in with the dog, so you may hear some ways, but you'll see a list of contractors that can put in agent that can do building shell measures like insulation. They also are trained to put in water conservation measures, so it goes all the way from foster raters to different shower heads to a water heater or more efficient water feeder, and... I think it stops there. But those contractors are just typical contractors that if you have a pair that you need on your house, that you're calling your a guy for your furnace, they're often dialed into these utility programs to help people save less on energy and tell you that there are rebates to help pay for your new efficient water heater that I would love to have here soon, so they are...

0:14:23.4 S2: They tend to interact with customers at the time of the need of replacement and offer the programs, and they're almost like the boots on the ground there, if there is a broad push to extend any water conservation programs, and knowing that contractors are typically... Even if we're not running the program through them, in communicating through them, we're gonna need them to implement most measures, you don't need a contractor for a facet are rater, 'cause you can screw that in yourself, but you know for the bigger things, you do wanna have that knowledgeable professional, so relying on them is great, but it also creates a pipeline of work and a constrained pipeline because as you know, trains are reducing in younger folks and we're having a gap in bodies going into trade professions, and so that is something that as we're thinking about climate. Across the board, we know that to get these solutions into homes, we need to have a strong contractor network, we need to have electricians, we need to have a track specialists, so I hope I described how we work with them and the bulk of making those programs go lives in educating the contractor network.

0:15:56.5 S2: About the importance of energy efficiency. From my memory, we don't... There's not a lot of entity put on water conservation, their club, and you could build some really great advocates and that community as I go into home to say, Hey, we have some water conservation

measures. Did you know this? Did you know we can do this in Michigan and kind of be the cheerleaders, but to do that, you also need an incentive structure to offer so that the contractor has something to offer their clients, and just to clarify, there is no incentive structure for the contract or other than having access to customers who are interested in efficiency, so they just get business hopefully from the programs, but we could think about water conservation as we relate to customer and demand in that way. So if we were trying to get some water facilities, municipal facilities more efficient and we know the amount of investment, we could have a workforce of contractors to specialize to say, Here's everything we know about these folks, here's how long it takes a project to get done, here's the cost, here's the rebates we can offer from the State to make this more efficient, and the contractor then kind of sells the project, walks them through it and then they get paid through it.

0:17:31.8 S1: Yeah, thank you for that. Yes. What do you think, and I think you touched on a little bit, but what are the individual motivations within sectors that you think drive water participation and efficiency?

0:17:55.7 S2: That's funny. So my experience is getting rooted in energy efficiency and then in this role for the state, so first and energy efficiency, most of those folks on the demand side, residents and businesses are just trying to lower their bills, so they can lower their water bill, they can lower their, if they use electricity or some other fuel type to access their water, they can lure that bill through efficiency, and so it's just one of those things to help lower the overall bill when matched with other measures from... So that's my old world from this role, the motivation is similar, but it's at a larger scale in that we are primarily working with municipal water utilities to lower their operation costs, so that hopefully they can... Well, there's two-fold, I wanna say. So it's lower the operation plus, but some of the efficiency measures, and I could be making this up, but I think that some of our conversations previously with in her concern was quality of drinking water, so we want those facilities to be able to produce high quality and drinking water, and I believe there was a link between some of the mechanisms that would allow them to do that, an efficiency, so the mechanisms help them with water efficiency, therefore we were able to support it financially.

0:19:39.9 S2: So I see a two-fold infrastructure needs and cost, infrastructure is reducing the burden there is huge for any municipal facility, and then drinking water quality, so it's that focus again, is less about that wider Big Picture water conservation, but that's where I'm seeing some of the motivations for participating in that respect.

0:20:06.4 S1: Yeah, and so we've mostly been talking about from my perspective, and use customer, residential water use and conservation, and then we just go to and muscle. Are there any other sectors that you see as good opportunities for water conservation efficiency that we haven't touched on?

0:20:26.2 S2: Not any that I know enough to speak intelligently.

0:20:33.0 S1: No worries. And then are there any challenges? I know you talked a lot about the

education barrier, which is great. Are there any other challenges to implementation of programs or just generally to a conservation and efficiency that you've experienced in work...

0:20:49.8 S2: I think when we consider education, an education awareness and the other barriers of access and financial barriers, that when you put that all together, we are missing a cohesive approach to really pushing water conservation in the State of Michigan, in pushing our relationship with water to be more efficient. So I do think that there could be an education campaign, I do think that we could maybe go a bit harder on water efficiency through our existing program models and communicate the benefits of such a program. I think it could pay for itself and have tons of reverb rating benefits.

0:21:49.6 S1: Do you mind expanding on that a little? Within the existing program models. Sure.

0:22:00.7 S2: So by having a comprehensive program or push, and again, thinking about how we deal with energy efficiency, and there is a comprehensive... Their goal set every year for how much we wanna conserve on water, the water efficiency measures that we use in an energy waste reduction program only get credit for energy save... They don't get credit for water errands, even though it's saving water, we are not accounting for that and we are not valuing that in the program equations, if we created... I don't know that we would need to create another redundant program, we could... We have one modeled after the Energy waste reduction programs that was primarily focused on water conservation, and then any incentives applied will be based on whatever gallon saved, then we could have... That to me, would be a better model for a comprehensive program because then you could build your communication, you can build your project pipeline and everything off of that, so it would either be creating something that's the same, that uses those market-based solutions, or you could have a piece in the Michigan energy measures database that value... Put a value on gallon saved for the measures, if you have a value like, Hey, utility, if you save this much a gallon of water, there is an incentive, will add an incentive for the customer, but then you also, at the end of your year, if you have these results evaluated, you then get a bonus as utility do, then the utility is going to do everything they can to convince people to save as much water as possible, so that's kind of what I'm talking about, having a more comprehensive program where you're using market forces and incentives to get people to save water, and just kind of keeping that put right now, I can't talk a lot about what other ways it could be comprehensive outside of the energy space, 'cause of course that's my go-to, but I know...

0:24:36.2 S2: I'll just stop there, 'cause there's so many things Emily has educated me about the Christ holding and Department of Natural Resources is educated me about, and I just... I can't keep it all in my brain.

0:24:48.2 S1: And I don't wanna be redundant, but just to clarify, so what I'm hearing is that there's kind of a two-fold way to integrate the energy conservation programs with water, one of them is that water is already being saved through these programs, it's not just being... It's just not being valued or tracked, and then the other one is, in addition to that, you can add some additional water conservation incentives to bring it all together. Is that correct.

0:25:11.2 S2: Ethan, that incentive structure and the program is... Impetus to the programs is a legislative action. So I started way back in PA 295. Well, I think it started before the p95 was awesome, and then we have the ACT numbers that I cannot remember right now. It's like 3 42 or something, where under the Snyder administration, they re-develop that, so I think that you could... A legislative action on water conservation that would kind of set the incentive structure and how the program operated would be the mechanism by which to create a comprehensive water conservation program from a residential and commercial demand perspective. And I just thought of this, and it would be really cool because we have a lot of water infrastructure issues across the state, I know Eagle has a ton of... Maybe it's not a time when you think about the infrastructure issues, but a part of money that's supposed to go to water infrastructure pipes with the focus in Flint and other places around the state, and if we were to have a comprehensive legislative push, it would open up dollars to make infrastructure more effective in their... By increasing water conservation system wide and long.

0:26:41.6 S1: Similar notes, are there any opportunities you see with any new or upcoming energy or climate policies programs, legislation that could include water conservation in the...

0:26:59.0 S2: I think they all could include water conservation right now, though, I will share that a lot of the climate policies and pushes, our focus on mitigating emissions and reducing fossil fuel condition, so the political support in the climate world is... At this point, I'm thinking about different levels. We're unable to keep water as a priority case and point, our own council on Climate Solutions has different work groups, we have five different work groups, and when we initially proposed what needed to be considered under a technical worker water was one of the topics we propose... But there were just like food ways and some other ones, but when you rank them, given their contribution to overall climate issues, water tends to drop, which is insane, right? When you think about it, because everyone's like, Oh, we gotta mitigate missions, let's get this down, and water conservation is not as important, or water is not as important, but now we look at what we're seeing across the country with increased flooding in areas at a speed that we did not anticipate and we're seeing negative impacts, I do think that there's a huge opportunity for us to step back and not only look at climate issues from a mitigation perspective, but I think of the climate issues as a system perspective and what we will be experiencing in our communities, and that even if it's not just conservation, that water period should be one of the top issues because water is so powerful and important.

0:29:17.2 S1: Yeah, great. Jeff, anything else content-wise? And I'm gonna move into a view, if there are any publications, white papers related to your work that you think would be beneficial for us to read... Yeah, I don't have any questions.

0:29:35.7 S2: I... Yeas. There any resources other than just mallards or themselves with programs that you think is horrible in this job... I haven't written anything public or published anything, which is insane, and so the Office hasn't produced anything yet, we will be producing the climate plan that... Fingers crossed. Will come out at the end of January next year. I am trying to think through what the work groups are producing now, and as of yet, I don't think

nothing, we're at the stage where we're still creating, so we don't have anything at this time focus on water, but we will... Because it's important.

0:30:25.6 S1: Great, and just to give you some space, is there anything that you think is important for us to take away that we haven't already spoken about or any opportunities that we haven't touched on? But

0:30:38.7 S2: First, I just wanna say, I love that you guys are doing this project. This is awesome in its space that Emily and 90 and night when we would try to get together and just do brain dumps on water issues, and it's very difficult to effectuate action from our positions and get that change and just have the deep thought on it. So I'm really grateful that you guys are taking the time to work through it, I also just wanna leave you... I wanna leave you with that feeling that you're doing something amazing, but then also that we have a lot of opportunities to create something new and create something that will really help the state of Michigan, so enjoy the creation process and we're really looking forward to what you come up with as well as just preparing to justifications for what you guys think so... Yeah, thank you.

0:31:48.9 S1: Yeah, thank you. We're very excited about the work that we can all provide you guys... I'm gonna go ahead and stop the reporting.

Transcription

Interview 3

0:00:02.0 S1: Okay, perfect. So we can go ahead and get started. So again, thanks for being willing to talk to us as you mentioned, and we kind of mentioned we are really interested in the intersection of programs and policies, as well as the environmental justice component and social determinants of health and everything related to water conservation there. So like I said, we're just trying to gain your unique perspective, and it's really just your perspective as an expert, it doesn't necessarily have to be tied specifically to any role you've had, but all of it has, I'm sure. Informed your expertise. And so we did some of the questions ahead of time. It's okay if you didn't have a lot of time to go over them or anything, but we are curious just from the top of your mind, and bearing in mind, we've also done our own research and stuff like that too. Don't feel like you have to go over everything, but for you, are there with programs or policies have you seen implemented by the State of Michigan that really do contribute to water conservation and efficiency, and in particular, within those programs, which ones are you really come to mind that do concern environmental justice.

0:01:20.5 S1: So

0:01:21.1 S2: I would say in my previous role when I was on the clean water public advocate, there weren't a lot of policies associated with the drinking water as it pertains to conservation efforts, and there's a lot to be said about that because we have aging infrastructure. And when

we think about traditional water conservation, we think about not using your water, we think about What are ways that we can decrease consumption or use of water, and in Michigan, like a lot of other odor states, you have to keep in mind that water has to move within the system to ensure that there's good water quality, so water drinking water or potable potable water in regards to water conservation, there has to be an understanding that there's a line between telling folks not to use their water and how that may impact water quality. Now, with that being said, there are ways that you can conserve water, especially in means older system, a system, as you think about aging water infrastructure in the water that goes from the treatment facility to the distribution system to the home, when their age or when they're built for communities that have had the managed and capacity, so if you have a Detroit where it was built to hold a certain population and that population has left, that degrades the quality of the system, it also impacts the maintenance of it, so there's a lot of leaks within that that contribute to loss of water and the water suppliers call it...

0:02:54.5 S2: What is it? Non-revenue water, but essentially your consumers are paying for that just in a different way, not through their direct consumption, so there aren't any direct policies. I think that there should be some... I think that there should be a focus on what are we doing in these older communities that we know have aging infrastructure that are losing water underground that may not be apparent to a lot of folks, because that contributes to, again, water quality issues when you have leaking or a defective system under Crown and then also affordability, and that's a huge thing in Michigan as we think about how do we support an affordability plan or a disadvantaged community when we don't have that distribution of income of the high income, low income to average it out. So one way that we were tackling that is through the water leak pilot and looking at what are two communities that we know don't have a program or policy supporting these things, and what are some interventions that we can do at the state and local level to support addressing water leaks and tackling water conservation in that way, so I can take a little bit of a deeper dive and provide some information about that water Lynott, but I don't wanna deter you from your next question, I'll let you know how...

0:04:14.2 S1: Yeah, I think so, we've definitely come across the water leak pilot, like in our research and everything too, I think I'd be curious to hear from you the things that we can't just find on a website, more so kind of like what you perceive the success of that program is, if there are areas that you're like, Wow, that wasn't so great, or how we could... What we can learn from that as well. And just your overall perspectives and opinions on it.

0:04:43.8 S2: So that pilot is still underway, so you're right. As we were thinking about rolling it out, there was definitely a phased approach in mind with me leaving, we weren't necessarily able to pick up phase to phase one was really looking at it in a good individual level, we know that there were some homes or our families or residents that we're getting bills that were like maybe two grand because they had these links within their home, and typical the way it works with funding and structures, your local municipal water system, they're responsible for the piping outside your home, but no one is really responsible for what goes on inside? And so we were looking at what are ways that we can kinda tackle the need, and again, an aging

community where we can address some water conservation strategies, where we can address the leads, we can provide them with some information on what they can do to conserve water effectively without impacting water quality, and then also include an energy efficiency side to that to me, 'cause we know that they're all tied together when it comes to overly efficiency of the home, but what I would think in terms of what you can find is these two should really revolve around what are we doing outside the home, and that's when we have more targeted funding and policy around making these efficiencies within the distribution system.

0:06:05.7 S2: You hear a lot about the service line replacement as it pertains to LED and water quality, but what you don't hear about is the impact on water conservation and just again, efficiency through the system, pops that acquainted to getting the water to more efficiently... All of these things contribute to affordability and water conservation overall, so part two of that was, Okay, we tackle in the home in that community, and then we provide some funding to the water supplier themselves so that they can make these measures, they can have meters that detect when there's high usage within the home, but also if there's leaps within their distribution system, so that they can plan and kinda target which areas they're gonna replace, whether it's mains or service lines and everything in between, but you need to have their technology, which means you need to have that investment and for disadvantaged communities that are already struggling just to cover the cost of their water, these are usually things that they can't afford to do, so there has to be targeted Federal and State funds to support an investment and being proactive and looking for these on ways for savings and again, water conservation within the distribution system itself, so what we were suggested or what I was recommending was really having a bridge between our energy and water factor where we roll out these comprehensive brands, and again, they would look at what is the water and energy efficiency, what are the water and energy needs to provide water to home and how can we address it through, again, I mentioned the pumping systems, making sure that the system itself is intact and we address those concerns.

0:07:49.7 S2: So that would have been the next step is providing funding to those two communities to again measure what's the impact of addressing these at a distribution level in addition to... At an individual level, another thing is, we look at again, it's such a complex stage, and this was one thing that I love to help a job, is that you pull it back and there's more and more, so you say, Hey, yeah, we provide these federal and state grants to communities that are in need. Well, let's be real, like a lot of the communities, and the two communities that I'm mentioning, they had an emergency managers in place, Highlander, the city no longer operates their water system, a private consulting firm does, so they not necessarily have the capacity to even apply for their federal grants to make these repairs that I needed adjustments to their system, so that was another thing where I was working with the Michigan and is a plague and the My Foundation to think about how are we filling the gap so that's where equity comes in. We know that we can provide brands, we can have all this great criteria for saying This is how we're gonna rank them, but if you can't get a community to the table because they don't have the staffing to apply for it, or the capacity to apply for it, then again, that's an equity issue that at the date a federal level, it's our job to fill that gap, so we were working to develop what we're calling navigators that would go out in disadvantage and distress communities and really

help them in terms of assessing what their needs are...

0:09:27.0 S2: So you would have a strategic person that would look at the water system and have an understanding of how this system works, and they would have says, These are the things you need to do, and this is the order, and this is your short-term strategy in your long-term strategy, and then you would have a grant person that would work with that strategist and come up with, Okay, these are the grants that may be able to be utilized to address these concerns and here are different additional avenues that you can to fulfill those needs so that's again, where it is kind of a roll-out approach of so many different things coming together to address these concerns, so those are two things that you wouldn't have necessarily read in a reward or online that were next steps and looking at this more comprehensively and really addressing the core issue, because water conservation is not like getting in California, where you're saying, Hey, just don't use your water, it's different here in Michigan as to how we think about water conservation within the home. Absolutely, thank you.

0:10:27.4 S1: That was a very great answer. Provided a lot of information that you're right, we haven't really been able to just read... To report or anything like that. In as a follow-up to that question, I am curious how... I guess I'm wondering what challenges have you or have you seen then faced in reaching out to disadvantaged communities, and how do you make sure that those voices are accurately represented and you found the right voices to speak to it, and you kind of... Along those lines, yeah, I'll stop the question there. 'cause I was a lot of words.

0:11:06.6 S2: That's a great question, and I would say part of my job was rebuilding that trust and understanding that the state coming to the table is not necessarily always... It's not always brought with applause, they're not always excited to hear that the state's coming because some of these communities have been under an emergency manager, and I don't even think people understand the impact of that. That means that you have a state person that comes in that sometimes dismantle the entire team that you have, and so when they're left, they're left with maybe a third of the staff that they would need to operate it because those resources were coming from the state and now that emergency manager is no longer there, so working with the distress is advantage environmental justice communities, we have audience different names, but they're usually the same communities, you have to be mindful that you have to be transparent in what you wanna do, and you have to listen more than you talk. And so that's a lot of just what I did, for example, and Ben Harbor is I met with the City of fishes there. I also met with their community-based partners, and I wanted to hear both perspectives of what worked in the past, what didn't work, and where are we hoping to come together.

0:12:21.5 S2: And one thing that I found that was really helpful is really, again, having the separate conversations upfront, but bringing folks together, and so I developed a task force and Ben Harbor that was really comprised of residents, faith-based leaders, community leaders, city officials, the local health department, and all of our state partners from ego and DHHS, and even a represented from the governor's office to really talk about comprehensively what's going on with water quality, how can we address these different thing... Needs of the community. And I think, again, it wasn't this miracle story of a sitting down at the table and

everyone just so excited, there were a lot of tough conversations because there's a lot of conflicting views and there's a lot of different points of views, and so it's really about aligning over that key principle, we all wanna make sure that community residents have the tools that they need to be protective of public health, and that they have the information or resources just to sustain the community in general, and that's what we're really kind of rally behind what the city, what does the community need? How can the state provide that and not as assuming to know what they need, we're really listening, what do you want us to do to support your community, bring in those resources in, and they're, like I said, really aligning what are our key objectives for the year, we held a community forum when we talked about water conservation, water quality, and I have to be honest and disadvantaged community, when you say water conservation, they don't wanna hear what you have to say because that's not an immediate need when you talk about water quality and being afraid of your kid not drinking or drinking the water and the impact of that, that one's our tie-in.

0:14:09.3 S2: We first approach is water-ly pilot and we said, Hey, we wanna make sure that we're addressing leaks in the system, they're saying, You're here about leaks, and I'm concerned about what this water main... Doubting what I heard about what happened in Flint. So again, it was about marrying the two and letting them know that these are all interconnected, we take care of this because of the impact on that, but having those real conversations and putting our ego aside and letting them share how they felt in providing accurate information, so I would say that's the foundation of really working with communities that have been underserved, is just really kind of meeting them where they are, listening, providing what they need, and then just really being a support for them and framing it in that way that we're not here to lead you somewhere. We're here to support where you wanna go.

0:15:01.5 S1: Yeah, okay, so I guess what I'm hearing a lot is needs assessment was very conversation-based, it wasn't sending out surveys or doing a bunch of the scientific research, blah, blah, blah, is really just having conversations and within communities and everything.

0:15:17.2 S2: 100% because there's also literacy. There's a literacy barrier, when we think about... At the state level, we think about these great surveys that collect a lot of great data, but you have to almost do those in a focus group setting that isn't very formal, so it was really about relationship building, asking those questions, coming back and re-framing them in different ways, but we couldn't have captured this through a survey or anything, we really had to build those relationships because I have to be honest, so I got approached a lot about folks wanting the survey, Flint residence, you know, there's all these studies that they wanna know what were the impacts and how did this as... And can you help me get a survey out to the community? Well, I can tell you they're tired of surveys, they wanna feel her, they want that face-to-face, they wanna share what they have on their heart, they don't wanna answer pre-prescribed questions, so it's really about leading out there and hearing what's important to them, even though you kinda have an idea of what you think it has to be incorporated within it, but kind of really leading on what's driving them, and then infusing your objectives into that.

0:16:29.6 S2: Okay.

0:16:30.6 S1: Thank you. So I guess I'm curious, it sounds like at the very beginning of this question, you were saying there really aren't... There isn't a lot of policy surrounding like Drinking Water and Conservation, especially with a social justice focus or anything like that, but with the caveat that the water-Laila program is... Is one of those things, is there anything else tangentially related or something else that's also kind of at the beginning stages similar to that, or is that the main program that you would think of...

0:17:04.3 S2: Well, at the state level, it is because this is a new to Michigan, it's just these communities didn't qualify for the local level program, that's similar in a great area, there's way Metro Community Action Agency, and they've been doing energy efficiency for years and during covid, when we were restoring waters due to Governor women's executive order, they were very integral and just making sure that people had access to water, and through that outreach they determine, Okay, we're going in to reconnect water and some homes don't have indoor plumbing, or they have these major leagues, they have flooding in their basement, they... I've suiting their basement, so they continue to do some work with a very limited budget and at the local level, so there are these kind of one program here, one, they're kind of siloed throughout the state where they're doing work because there's need state-wide, and this is again, isn't something that's just for metropolitan areas, there's a lot of communities up north that we're expressing, Hey, how can we be part of this highlight we have aging infrastructure. We have all of these other issues. How can we be part... So this is really a Michigan-wide issue that we have to make sure as we're thinking about investment in that we're looking at it comprehensively, we're not just saying, Let's replace the lead service line and forget about everything else.

0:18:26.4 S2: It's like the body, the human body, you replace one thing, you have to think about the impacts on the other places too, and kinda look at it holistically. Absolutely.

0:18:36.6 S1: So kind of what I'm hearing is... Well, one of the questions that we have is a little bit about other stakeholders or other organizations that the State government works closely with in order to implement a water conservation and efficiency programming. And what I was hearing a little bit is it was like the local local programs were kind of stepping up and providing more of a framework for how that can work. Are there other local programs or other programs in general outside of eagle that you have seen or you yourself have worked closely with.

0:19:16.7 S2: Besides the Community Action Agencies that kind of stepped up during the covid response? I would say it's primarily way Metro is the largest of the Community Action Agencies. There hasn't been a lot. I would tell you because there's been some federal funding that we're talking about water assistance, because that was something that was noted during our covid response, is that there were a lot of families that were living without water for months and years, and so through that they're calling it a leap, I love these acronyms, but it's similar to like where it's an assistance program for water through that, we're having discussions about including some policy where it incorporates plumbing, so again, looking at What are we doing to address address Ford ability through making these plumbing investments through again,

providing information and education about water and energy conservation, so I see this is like the perfect timing for what you are doing because all of this has to come together, and I'm not sure if Emily has connected you with the team that's working on that. If not, that I can definitely share their information, but I think they're gonna be the major players and making sure that the state-wide policy, these policy recommendations in a trickle down, because you know at the local level, if you don't have policy and funding to support it, you kind of do the best that you can based on your limited funding, right.

0:20:51.8 S1: To my knowledge, and Jeff, you can chime in if you know differently, but I don't think that we have received that contact information from Emily and we would really appreciate it, we can follow up with an email afterwards to... As a reminder. So one thing that I wanna make sure we focus on, and I think you've touched on it a little bit throughout, but I'm thinking about the major challenges or issues that you have faced you as you, as well as the organizations you've worked with in the roles you've played in implementing these policies. From what I'm hearing, it's funding, funding, funding. I'm curious if there's more within that, or specifically, is it like the allocation of funding or is it just there is no funding or kind of... And any other issues or challenges that you have seen?

0:21:40.6 S2: So there's a laundry list of reasons as to why this hasn't rolled out so quickly, and we know that there's a need, and part of it is that water isn't regulated in the same way that energy is, so as you think about Consumers, Energy and DTE and how they're regulated through the NPC, they regulate every aspect of it, essentially, well water is regulated through ego as far as quality, there is no oversight in terms of investment and affordability, so these local water systems are owned and operated at the local level, there's villages, there's small cities and so maintenance and investment of those, it's like... That's the issue right there. It was more regionalized, then we can have more control and not even control what we can strategize more on how we disperse funding, we can give more recommendations, but because they're so dispersed, there's over 2500 different water suppliers who are out Michigan, and because there's so many... They all have their different challenges, it's almost like you have all of these funds, but there's no strategic direction for it, so it goes in all these different ways, so that to me, I see as the major issue is that there needs to be more regulation over rate structure, because rate structure influences those investments in the infrastructure itself...

0:23:19.0 S2: Absolutely, that would be the top tier thing for me is that there needs to be more state-wide oversight into how water suppliers operate, because essentially if you have a community where they don't have the revenue coming in, you automatically know they're not gonna have the money to put into maintaining the system, and a lot of the communities are reliant on water to basically offset other program areas, so you know how some communities, they outsource their trash, you see ranger or something. It's usually a strategy to save money, whereas with water, they wanna keep it in-house because they get money in a different way to make an allocated to in fill gaps. So again, having that oversight on how they're used in their revenue, and they're supposed to be putting it back in the system, like you pay your water bill so that you can maintain your water system and not to diverted over to in other areas. So again, that oversight is key, so I think that's part of it is the state having a more of an

understanding of how water systems are investing in their system, and then there just has to be some policies up until recently.

0:24:36.7 S2: Many folks don't even think about the infrastructure, and they grow into the Flint water crisis and different prices across the nation, like you just figure it, water comes out, you're tapping, you're fine at the taste a little funny, or it looks a little funny that you... Then you have concern, but you didn't really think about all of the things that are involved in treating water and was the source of your water? And all those different things. So again, there has to be an understanding and education about how these things, an investment impacts overall quality of health and in the health of your community. So I think there has to be an educational component because... And the reason why I say this, because you have city council members who basically may decide if a water department should invest and maintaining their water system when they may not have it, understand they have a pothole in the ground, you know, down the street that they're getting 20 cause about... But there could be a pipe where nobody realizes and telethon, there is a huge issue. So there again, is that immediately, so I would say again, oversight education, and then you have your policy and funding, because you can have...

0:25:46.1 S2: You can have all of these other... You can have policy and funding and then it may not go to the right community because again, they're not understanding to prioritize it or understanding how this fits into the bigger picture, so you have to have all of those components to make it work. And that was really kind of the foundation of why the office of the clean water Public Advocate was created, was really to kind of align all those efforts have a broader education plan for the greater... For all of the residents and also those key leaders that are making decisions, and then address those equity gaps. Thank you.

0:26:25.5 S1: So in trying to take these challenges where we're asking the experts about these things and we're curious if you have insights or you see opportunities for how oversight could come to be better oversight could come to be, or you know how we could have better education about these things, I know these are huge issues and it doesn't just take one person, and there's obviously a reason they're not there already, but I am curious if there are... If you have specific ideas within that.

0:27:00.5 S2: So I would say for oversight, water was regulated in regards to reset in, I wanna say maybe 20, 30 years ago. So revisiting that and really looking at what were some of the barriers... Why did that change? Because I think that should be the starting point. That was something that I didn't really have a lot of time to tackle in my role, but that's really the foundation of it, why was there a shift here in Michigan as to water rate structure and how it's regulated? When I think about policies and things I think about... I've been very fortunate to be able to work in the environmental health world, public health world, infrastructure. And so for me, it's a clear vision of all of these things are connected, and sometimes people don't necessarily see that, so in my new role in health policy, I'm really gonna be looking at social determinants of health, so how are we connecting the worst... When we're thinking about the environment and the impact on health outcomes, how are we thinking about how we build a community and what's in the community in terms of resources? So I think it's about having

these teams of individuals similar to how the Dow Fellows are set up, all of you have different background areas that you bring together to strategize and think about a process comprehensively with different lenses.

0:28:17.8 S2: That's what we need to have at the state and federal level to look at these and think about all the connections that we have, I don't think there's gonna be one funding source or one policy that's gonna solve it all, I think it's the alignment of all those efforts, and so there has to be a strategic thing as to, This is what Michigan is gonna focus on, and these are all the policy things, levers and things that we can align within that, there's funding that aligns with those policies, really kind of picking your top too I like to say pick your top two buckets, go from there and think about impact, because when you have all of these separate programs and policies and you look at it so very siloed, that's when you're wasting resources and we have limited resources like any other entity, you know there's only so much we can do in regards to the drinking water reboilered only so much we can do when there are APA grants that are out, so how are we being strategic and maybe combining two sources or thinking outside the box and leveraging other resources for a greater impact.

0:29:21.5 S2: So I know those are broad answers, but I think it's really about setting some priorities, and that's something that I think Michigan has to do, we have to look back at why rate structures are regulated, why that changed, and then again, what are our priorities... What are we hoping to tackle in the next year or so, and then once we set those in all the different groups, whether they're for-profit, non-profit government, can all align under that because they know what we're working towards.

0:29:52.3 S1: Yeah, and so that kind of leads me to another question we have, and maybe at least I see the connection here is I'm wondering what individual motivations and incentives you see behind implementing these changes at the end of the day. So I was hearing a little bit about when we look at social determinants of how people can be generally, I don't know, there's something about humans that we kind of relate to, Well, this is important because people are dying where people are... Stuff like that. I'm wondering if there are things along those lines, is it where health-driven, do you think that the government and sectors we work with are more like money-driven, what are incentives that you think can be played off to really implement these sorts of changes?

0:30:40.6 S2: That's a great question, and I'm gonna tell you, I think that's again, these are the drivers, so you touched on them help what are the health outcomes when we think about covid response, and when we had that map of where we were seeing huge disparities in the first two months. And we were thinking, why are these communities had harder... Health outcomes is key. You can overlap where there's a lack of investment in infrastructure, where there's environmental quality issues with health outcomes, it's like they line up... Yep, perfectly. So there's health outcomes, but we know that doesn't drive everyone because we can't even get everyone to follow cover restriction. So that's a part of it. The other thing is economy, when you think about replacing pipes, investing in that, those are jobs that's creating jobs. So again, if you kinda dive into that buying infrastructure plan, you know that's why I think he did a great

job of thinking about it comprehensively, so it touches on, again, addressing equity, creating jobs, creating a workforce, those are all things that are drivers that at least even if it's not a thing that you're aligning behind, you see one and you're like, Oh, I can get behind that one.

0:31:52.4 S2: I think it's a combination of all these things coming together. And when we invest in water infrastructure in touches on all those things, health outcomes, it creates jobs, it allows us to create... To influence workforce by getting more plumbers, more engineers, skilled workers and unskilled workers, jobs and training, it impacts just the prosperity of the community, so when you have construction coming in and out, and you're replacing water Manor replacing this, you're investing in roles, you get more businesses. They come in, so I like to look at it holistically, like environmental health, public health, prosperity of the financial prosperity of the community, and this touches on all of that, so those are the drivers and it's like... I think if you list them all, like I said, a person can kind of cherry pick... Yeah, I'm happy about that one. I can do without the other ones.

0:32:48.4 S1: Yeah, do you... And hopefully, this doesn't become too philosophical on a question, but I'm curious if you think that those sort of incentives, if they are pretty much the same on an organizational level as well as individuals... Within community level, if that makes sense. Do you see each individual person holding at least one of those incentives and then either governmental agencies or non-profits or whatever, also holding those incentives, or do you tend to see certain organizations prioritize some incentives versus others kind of deal... Does that make sense?

0:33:30.5 S2: I think it could be relatable, one of fronts, because even as you think about health outcomes and people may look at that differently from a health system perspective or an insurance perspective, you're thinking about cost savings, and when a community is unhealthy and they develop chronic conditions, that's costly for the system, especially if they're uninsured or under-served or whatever term you wanna use, that they cannot pay for the services, but this purposes have to be done. So again, it relates to economy, I think it's about breaking these concepts down because they can be relatable to an agency or on an interpersonal level of how it impacts you on a day-to-day basis, so it would be breaking down what do we mean by health outcomes and how does that... The impact each sector, because even for a business sector, until lately, people didn't understand, well, as a business, why do I care if my workers get sick it, well, this is how it impacts your body or bottom line. So when you think about environmental health, why does that affect... This man, we sign General Motors had to use water from a different source because it was impacting the quality of the vehicles that they were making, all of these things are again, interconnected.

0:34:46.3 S2: I think it's all about how we communicate that and how we show that your day-to-day life, it can be impacted by all of these things, whether you care about them or not, they're impacted, and then at an agency level... Because again, that really comes down to bottom line, let's be honest, when we think about larger corporations, it comes on to their bottom line, public health, environmental health, and even on a small level, the community that you're in impact your bottom line for this very recent... So again, I think that was a great

question, and it's all about how we communicate that and kind of break those concepts down, because sometimes with these larger things like we clean, we be around health outcomes and we think, Okay, well, what exactly does that mean? But it means a lot, and it means a lot to different factors, so I think... Absolutely, as you're thinking about policy recommendations and you're thinking about how this can be shared with the legislator, how this can be shared with the Governor's Office at the Federal level, you have to do break down what that means for each of these groups...

0:35:48.6 S1: Yes, I would completely agree. In your rate, it all kind of comes down to how we can use these motivations and incentives to play off why these things are so important in matter, because at the end of the day, we're all human beings. And I would think I wanna live in a healthy, happy earth and everything too, but also, yeah, sometimes it is just bottom line, like money or financial... What does the budget look like? Blah, blah, blah. And people don't necessarily make that connection between individual level day-to-day versus over all of my company and stuff like that, and I think like you said earlier, that's seen with in the pandemic and stuff, it's not really real until it affects you personally. And so working off of those things is key. Okay, well, let's see here, we are kind of at that 45-minute mark, and so I wanna make sure we've touched on some of the bigger questions that I wanted to make sure that we got to, but I'm wondering if at this point you have any other things that you felt you wanted to share, or if there were questions that we sent to you that we didn't get to touch on yet that you still would like to answer.

0:36:54.5 S2: So I would say one thing I haven't really talked about is just the EPA water sons program, and you're familiar with that program it. Okay, so great. That has been a great resource for me in terms of the work you did with the pilot. And just overall, we have a fix-a leak Week where we really structured around some of the efforts that they do on a national level, but they have a lot of resources and looking at this from state to state, so I know they just released a report and I'm not sure if you have a copy of that, but we were featured in that report, and they had all these other states where they talked about their water conservation efforts, so EPA water since is one, and then I worked really closely with way Metro Community Action Agency and that might pick a group that you wanna read out to, they're doing a lot of work in thinking about, again, what's the policy meeting for me it for that, and if funding was available, how could communities kind of pick up and will love their guy to implementing this in their community and addressing water conservation needs, especially in disadvantaged communities.

0:37:57.3 S2: So I know they're working on, again, a guide and kind of a framework, and they've actually contracted with public sector consultants to develop that guy, and I think they're anticipated having the police by the end of this year, but again, I can connect you with them if that's something that you're interested in?

0:38:14.6 S1: I absolutely think it would be... I'm not sure it'll kinda will see where our project lines up in terms of if we'd have time to interview one of them or something, but for sure, getting more information from them, I think would be great because... Yeah, one of the things

that we want out of this project is to be able to recommend or point out like, Hey, this is a really great resource, and here's a success, and here's where it's going, Well, this is an opportunity from Michigan to jump on and stuff like that too. And so I think that sounds like a great opportunity, at least to explore... Thank you. Both of those things and the water sends two... We've each kind of had our own area that we've researched, but I know that... I'm sure one of us has read that report, it wasn't me, but I'm sure it has been gone over, and then I'm trying to think, is there... Jeff, did you have any other questions or follow-up questions? He's been taking notes this whole time, I've been in running the show, but I wanted to make sure, 'cause I've had a lot of the follow-up things, I wanted to make sure I give you space to...

0:39:20.0 S1: No, I think most. Got answered. I think maybe... What do you think is the biggest mis-opportunity that you've seen?

0:39:31.8 S2: I think there's a huge miss opportunity when it comes to connecting water conservation with energy conservation. I think the energy folks are ahead of the game, they've been doing this for a while, and there's a way to kind of build on what they've develop policy-wise, how they structure their funding, I think, again, kind of piggy-backing on what they have done in their recommendations would be really key and critical in our next steps, so that would be the major thing, and I think Dr. Brandy Brown can maybe speak more closely so that you probably already met with her, but they have been amazing.

0:40:11.2 S1: Yeah, actually, Dr. Brown, we were originally scheduled for this afternoon, had to push it, but definitely on our list of people to interview a... Nice. Yeah, so

0:40:21.8 S2: We actually got our funding for the water pilot and we utilize energy funds for that, so that again, that's where again, they have the money because they haven't been doing this for a while, and so that's again where I like to really cross-promote that looking at that water energy nexus is key, because why recreate the... Well, where you can kind of build on what's been working, they have these energy assistance programs, weatherization, all of these different things that we're looking to be up in the water world, and so starting there it would be a great point. Absolutely.

0:41:01.2 S1: I'm trying to think. I think we've touched on all of the questions that I wanted to get through. Any last minute thoughts or questions that you had for us?

0:41:10.8 S2: No, I just be very interested in hearing or seeing the report you guys are done. I mentioned before, my world is now focused around health policy and planning, but being in the clean water public advocate role really just kind of changed my perspective on environmental health, so I really... I wanna make sure that's infused in our work, and so I'm gonna be doing some focus on the departmental level on social determinants of health, so whatever you guys come up, I would like to present that to our team so that we can kind of parse through that and think of how we can develop some policies within our department to support that... Absolutely.

0:41:50.5 S1: No, yeah, we will for sure be keeping you in the upsells everyone. Ultimate

interview, I think you and I are very similar in seeing the intersection between environmental factors as well as human health and stuff, and actually in I think it was 2020 who recognized climate change as the number one public health challenge or crisis, and so definitely, definitely connected. So we will for sure be in touch with you, we'll probably follow-up in the next couple of days to try to get some of that contact information that you had mentioned for the way Metro Community Action Agency and stuff like that. And yeah, you will. I'm updates from a... I believe a, I'm not sure if we are attending the council meeting tomorrow or Thursday, we'll have to see, but we sit in on some of those water Council meetings as well, and so I'm not sure if you're still sitting on those, so...

0:42:55.7 S2: I still have to figure that out. I'm gonna ask you a personal question. So what year are you, Alex?

0:43:02.0 S1: I'm a fourth year medical student, so I am soon applying to residency, that's kind of this month and next, and then, yeah, I'll be off the residency next year is...

0:43:13.3 S2: I have a lot of friends that have just completed their residency or are now practicing, and they love the experience of it all... I love that. Again, I feel like now they're incorporating more public health in it, because it is about having that complete picture, if there's ever an opportunity where you wanna dabble in policy or something, reach out to me, I'd like to have your background in the medical field as we think about public health policy planning. So

0:43:42.0 S1: Yeah, absolutely, it's something I do wanna continue to integrate into my career and stuff like that, so... I appreciate it, thank you.

0:43:50.8 S2: Alright, well, it was nice meeting you both been... Don't hesitate to reach out if you need anything else for me. I'll look for those prompting emails so that I can set you up with the two other folks that I mentioned, but... This has been great.

0:44:01.5 S1: Eye did. It's been wonderful. And a pleasure meeting you. Thank you for your time, so thank you very much. Thank you. Have a good rest of your weeke.

Transcription

Interview 4

0:00:02.8 S1: So with that, I'm gonna get started with the first question. Are there any areas where you feel that your state, Wisconsin has excelled at meeting or exceeding the requirements in the compact in terms of water conservation and efficiency, where do you think improvements could be made

0:00:26.2 S2: That... That's a good question. I'm not sure if you talked to shale and the team

over at DNR yet, they're really... They're responsible for the compact from Wisconsin's perspective, so I can give the curry how PSC is somewhat involved just with some of the topic areas, so the Public Service Commission, Wisconsin is the financial regulator for all 578 water utilities, public layer utilities for the state, Wisconsin. So there's a number of other water systems in Wisconsin, I think has the most in the country is somewhere over 10000, but in terms of systems that are selling water for profit or anything else, we're responsible for managing their financials basically, and ensuring that they're financially sustainable and are gonna be able to operate and provide safe water, so with that, conservation and efficiency is certainly a piece of the work that they do, and we have specific code that outlines what those requirements are, and I guess... The caveat, I would put it is that ultimately the regulation comes down to DNR and any decision that they make in any of their requirements, but there are certainly pieces or roles that we play in that, so... I think one of the things I generally think about from the conservation side for utilities is that they themselves are usually the largest user of the water, and by that I mean it's largely water loss or whether they've got treatment protocols that require flushing or other things like that, but by and large, the majority of our systems, 15 to 30% of the water used or withdrawn is lost, so some of that is lost in the accounting side, if they're just their meters or any accurate or the data transfer is incorrect for some reason, but there's a good chunk of that that certainly is real loss that's coming out of the pipe or other places, so for us, we basically regulate their water loss as part of administrative code PSC 185, it requires annually that they submit information on the water that they did lose.

0:03:12.5 S2: A, from there, we can calculate out what the financial cost of that water is to the utility, and ultimately that's a cost that's borne by all ratepayers, so that's, I guess the key element for conservation efficiency for us, we do regulate if a utility wants to have a financial assistance program tied to conservation efficiency, so like a toilet rebate is the most common that we have in the state, they do have to request that from the PSC if it's gonna be funded from rate payer dollars, so they would come in and request that they can use 10000, 20000 a year for this conservation efficiency program. We're gonna review that in most cases, they're using water as label is kind of the product of choice, which i series are reviewed pretty easy, given epas, I already signed off on those things as being good for water savings, we're just gonna verify that the programs are fair and consistent across all customers. And then generally, we'll approve that assuming it's a reasonable dollar amount, so they do require our approval for that. So I guess when we look at improvements, I'd like to see an annual review of our water loss, because we have so many utilities and just from a staffing level, it's really hard for us to look at every specific utility every year and see the trends in their water loss, is it simply we had a cold winter and they had a lot of broken pipes, or is it something that over the last five years we were continuing to see a trend and their infrastructure is aging and maybe there's something more that we need to do so that right now looks like us trying to improve our data system to identify some of those things in a way that is a little bit more cost-effective where we could target certain triggers that would take maybe a deeper dive, most of the time we see those things as part of a rate case when they come in to increase rates or as part of a construction case, because they do have to have our approval for projects above 450000 or 25% of the revenue for the utility, when they do come in or when we do see concerns about water loss generally, we're gonna require that they complete the WWA Frere water audit

software tool, that's gonna help them identify where that water loss is coming from, again.

0:05:54.3 S2: Is it infrastructure related? Is it real losses? Is it data error? What are the... Some of the things that they're maybe not thinking about that it could be... And then it's gonna provide some recommendations for them to follow, generally, we're gonna ask them for a plan in terms of, Okay, well, how are you gonna address that? And then I'd say, just in general, for us, it's about better education for the operators, we're a water-rich region, were a water-rich state, we've got a few pockets where the geology makes it challenging to find water for our utilities, but for the most part, they've got plenty of access, so helping them understand that even though there's a lot of water here, there's benefits to conservation and efficiency that they could find through, whether it's through our programs currently or seeking additional funds or other things to try to address some of those issues. So those are kind of the key areas I'd like to see better. We did... We've been trying to get additional training for the AWA tool so that most utilities could do it annually in-house, so that they're keeping an eye on it, and it's less about us even to come around and look and ask.

0:07:20.2 S2: So that would be, I guess, for us is just better training, better education, more consistent review from our staff in terms of what we're seeing on the water last side from the utilities.

0:07:32.8 S1: Thank you so much. One clarifying question, just so we understand exactly well, what it is, can the AWA... Can you just say the full name of your organization.

0:07:45.3 S2: So it's... The American Water Works Association, they have a free water out of too... I don't know if you're familiar with it at all, but you can... I think they just require that you submit an email address to download it, it's an Excel tool, they just released, I guess, maybe not, maybe it's been a year now. They have a new updated version, which is, I think it's even better than the last, but basically, it's kind of inputting standard data from utility, how much did you pump, how much did you deliver, making some estimates on where some of that loss was, If you're flushing the system because of unidirectional flushing. Yeah, you're gonna have some water that's lost, that's maybe unaccounted for, trying to make some of those estimates, they're gonna look for cost, and then they're gonna then three, four or five pages of questions to try and nail down how accurate the data is, how often you testing your meters, those types of things.

0:08:52.9 S1: Okay, thank you so much for answering. That is what we talked about. Kinda leads into the second question. What sectors do you think have the greatest potential for improving conservation and efficiency, and how does your state work towards making improvements in these areas? I definitely think it's gonna surround utilities in routine, it's the PSE, but maybe we can also address sectors you see outside of your realm that you work with that you think of the greatest potential in your state.

0:09:26.2 S2: Yeah, I think you Rimini ultimately, I would point back to Dr. On the sector-specific piece, but within that, obviously, we have some understanding of the sectors working within

the utility for us. Yeah, I'm Holly focused on what the utilities are doing specifically, and one of the things I think you would see is that that question largely becomes utility-specific, certainly we have some utilities where the 60%, 70% of their water is going to industrial users, there they're gonna see the most benefit from incentivizing conservation and efficiency on the industrial side. On the flip side, we've got plenty of systems that have no industrial users and are generally largely residential, some commercial, that type of program probably looks very different than something on the industrial side, so with that said though, I guess it kinda gets back to the educational piece for us, you were really focused on trying to help utility managers, utilities, ultimately headwater boards or whoever operates the system, I guess to take a step back, we have one system that is technically investor owned from a water perspective in the state, the rest of them are all municipally owned, and Wisconsin is a little unique in the fact that we do regulate all...

0:11:08.0 S2: You just play on systems as their own separate financial entity, while there is definitely crossover between the municipality and the system, we do technically view them as separate, so trying to also educate the municipalities on, Okay, here's some of the things that we're thinking about and specifically for us, right now, that's been a lot on our rate-making, customer-assisted programs are great, they have their place, but long term, how we structure rates is really key, forever, the Economic Development rate has been that declining block water gets cheaper and cheaper and cheaper. The more and more you use long-term, is that the right system for some utilities... Yeah, it might be for others. There are other things that we should be thinking about doing. And again, for a long time, it was... They'd come in for a rape case and we take a look and say, Yup, that looks reasonable. Well, this is how you've always done it, that makes sense, where now we're trying to at least ask a few more questions, get them to start thinking about these things because the larger systems generally are... And they have their consultants to ask some of those key questions about, Okay, what are you thinking about conservation efficiency, what other things do you wanna incentivize through your rates? One of the things you wanna be doing lead service line replacement, those types of things that you wanna fund through rates or small systems, just...

0:12:50.3 S2: They're run by a clerk and an operator, and they just don't have the time or capacity to do that, so we try to walk that balance of... We can be a resource, we can also be a regulator, it's a tight rope sometimes for us to walk, but I think by better education and asking the right questions as part of their rate applications or their construction projects... I think that's really where our focus has been in terms of identifying their local needs because it is localized with whatever sector may be kind of a key player there, and then taking our expertise or if they do have a consultant locally or... We've gotten Wisconsin real water or our cap or any number of other organizations that maybe be able to step in and help them figure out a system that would work, so that's, I guess the our focus in moving beyond the utilities and getting out into the sectors, and obviously, we collect all that data. Their meters are been by industrial commercial, those types of things, so we know where that uses or things like that, so we have a really real best data system that can help people make those decisions for the utilities or help the utilities make those decisions.

0:14:17.0 S1: Thank you so much. So it ties right back in. So in your work of utilities, what challenges or issues are you facing or experiencing and achieving a lot of conservation goals and objectives, and how are you overcoming these challenges?

0:14:35.6 S2: Yeah, it's largely the water abundance issue, managers know the water's there, and for them, there's incentive to sell it, that's, I guess unsurprising, that makes it easier for them to run their system, so I think that's probably the biggest challenge that we face from the PSC... Gana, it gets back to, how do we help them understand that there are operational efficiencies, there's OM efficiencies that benefit from that. And ultimately, we had areas of declining aquifer, what we still do in certain areas that costs more to pump the water, even if you're selling more... Ultimately, the long-term costs are gonna be higher, the engineering stress on the system is gonna be more... The chemicals you have to buy for treatment, right. Products, all that stuff adds up. From a financial perspective, from us that we want them to be aware of and paying attention to, so that's kind of where it is, and we can do the best we can to help managers understand the benefits of the system. And there are some really good ones out there, and there are some that are just focused on selling water and we can do better, I guess, in terms of trying to bring them in and educate them on the benefits, helping them...

0:16:11.2 S2: I guess technology is kind of a piece to that, helping them find the technologies that make sense more and more moving to smart meters, which is great, the AMI system costs upfront can be a little staggering for some of the large utilities, but long-term, the ability to track data over our periods and really nail down some of the demand factors and those things, when you're trying to design the system better to operate more efficiently. There's a lot of benefit there. That can still be found, I think.

0:16:53.3 S1: Thank you so much. Are there any conservation initiatives that your state promotes that you think could be beneficial to other states is thinking on the PS and P uses something that you might have seen a bit different that was constant. Does it fit better with you? Me.

0:17:16.3 S2: Sorry about that. Yeah, so I think ultimately, we have the benefit of regulating those Municipal Utilities and requiring that they report annually, all that information, I don't know if you've seen the van reports that we collect, but they're pretty detailed both on the financial side and the operational side, so we have a lot more information than most states do from the utility side in terms of what's going on from that perspective, so I think for us, the ability to track and monitor water loss, and as part of our rate orders are part of our construction orders to require them to at least complete the Audit Tool and come up with a plan of, Okay, here's our plan of trying to address this beyond... Well, we'll just do some leak detection and we'll replace a couple of pipes and that'll fix it. That just hasn't worked. So I think that's one thing, just from a regulatory structure, we benefit from... Yeah, we have a really strong focus on energy program, it's actually separate from the PSC, but they kind of work within our system, that's all part of the Low-Income Heating program, her energy efficiency programs, but they do provide some water savings devices, I think they've got air Raiders, shower heads, a couple other things that they sell direct to consumer, basically at cost or

subsidized, which I think is a nice model, I guess something I'd probably like to see more of on the water side, but again, that's largely funded through the electric utilities, so they have a lot more say in terms of what's being included in those programs, but again, I think it's a great system that at least there is some water efficiency tools out there at very, very low costs for consumers and...

0:19:30.2 S2: Let's see... Yeah, I guess those are kind of the big things from us that we probably do differently, like our model of being able to help direct or help give some guidance in terms of the conservation ethic programs that are re-payer funded, like the rebates, I think we've looked at trying to go further, but ultimately it's up to a utility coming to ask the question, but we have a lot of water softeners in the state that we've never had a water softener program to get some of the older water softener technology out. Those are the types of things that I think it would be great to see. We don't have the ability to mandate any of it.

0:20:32.7 S1: Thank you so much, and we're gonna take a turn in the conversation, what programs and policies implemented by your agency do you believe are the most effective in supporting water conservation and or efficiency in your state? From an environmental justice, water equity perspective, and why I know that's a bit quick of a turn, but...

0:20:55.2 S2: Well, yeah, but I think, again, the financial regular has maybe a little bit different view of this, and I think, again, our water loss control program, a little bit of a broken record here, but to me is really a key piece of that because where we can reduce the cost on the on M and for the utility, and ultimately long-term reduce the cost on the rate payers. To me, that's a key benefit that supports the water equity and environmental justice, again, the last the utility has to use, it's better for the environment, it's better for the customers, it's really... It's better for everybody. So that to me is the... Doesn't necessarily fit directly into some of that model of what we think about from the water equity perspective, but I think that focus is kind of important from our perspective as a primary pillar of what we do. I'd also say the model, our regulatory model as a whole, we are basically, we're looking generally at three things is it in the public interest? Is it gonna provide a benefit? Any time they install something or have a program, is it in the public interest, is it going to provide a service equal to or in excess of the cost, and then lastly, is it discriminatory in any way, and if it doesn't meet those three things, we don't improve it...

0:22:48.8 S2: So those are really the things that our commission or our decision-makers are looking at when it comes down to making a decision on any given project or program, so I take very seriously any time we're reviewing something, the focus on the discrimination standpoint and ensuring that we're treating all customers, all classes equally.

0:23:17.3 S1: Do you think there's improvements that could be made to those two points that you just outlined in terms of the environmental justice, water a equity focus is they are a fourth item that you would add... Yeah.

0:23:36.0 S2: Think the structure is good. I think we get back to trying to educate some of the

ways that we set up the rate structures. So Jan Beach, I think, has done some work in this over at Michigan State Matador, who's now at the UW, has done some of this, but you're really focusing on how do you set up your rate structures in a smart way, so for me, that would look like or I guess from a perspective of, we can't be discriminatory, if we're looking at the residential class rate, one of the things you could do is set a very, very low cost, first block that would be kind of the minimum amount needed for a low-income household to provide your clean, safe, healthy water sanitation, all those things, and you could argue about how much water that is and what is a reasonable cost, we've done a fair bit trying to understand what is the rate burden in any given community, but again, there's not a great way to do that from a media... In a household income, you just have got half the community living below that amount, so we're still trying to figure out how best to approach that, and ultimately that would be something that locally they would have to ask for, again, we can't mandate those things to them, but better educating them on the rate structures that...

0:25:16.2 S2: Who exists for the affordability? Concerns for the water equity concerns, I think are a piece of that, if we went a step further, some of the focus on energy work, I think is really, really good in the state, and I think is a model that could be applied in the future for water so one thing we know from research that's gone on in the state from the energy side is that those with the highest burden, not only are they the least able to afford the cost of electricity, but they generally use more than others, again, they're largely renters or low income households, so they don't have the money to upgrade the fixtures, they don't have the money to put in new insulation, they have issues with windows, those types of things, so we do have a weatherization program on the electric efficiency side that does a really great job with low income households that going out and doing the work, paying for 80% or more of the cost of upgrading those households, I think there's been some work from a community scale in the Madison area from a group called Project HOME, where alongside of the energy efficiency, they've done some water efficiency, not to the utility, that was a separate community funded program, but I could see a place where with some state funding or federal funding, you could set up a program like that that would target low-income households or target renters and could provide the water efficiency, conservation things to them that would help them reduce their burdens of cost, because I don't know that there's research out there, I hadn't seen it, that again, the low-income users probably have higher usage than the average household when you're talking about in-household usage as opposed to watering lawns and all those things, but I would suspect that the older housing stock has leaky pipes, older toilets, faucets without air rates, those types of things that are pretty cheap and easy fixes that it could go a long way in helping them use less water cure less costs.

0:27:40.3 S1: And that just makes sense. Thank you so much. There's a lot to unravel from what you said, so we're almost towards the end of the interview on almost a penultimate question, what measures would you recommend be added to your state water conservation efforts that are not already in place?

0:28:02.3 S2: Yeah, well, I think where we ended the last question for me is something I'm interested in, again, how you fund that is ultimately gonna come down to whether the

legislature and the governor agreed to put it in a budget or if there's federal funding that comes around or again, locally, you have some dollars that are not from the utility, could absolutely be applied to such a program. So again, kind of using that focus on energy model to target customers that are in native assistance for water efficiency and providing them that... I think we could improve some of our code as it pertains to water loss as PC 185, we could probably clean that up a little bit, make it a little bit clear, focus a little... It's largely designed to mimic the was water out a tool, but we could maybe go a step further if we had the right data system, potentially we could even set it up that most of the numbers would pull through into the water out of tools, so they could very, very easily complete their water audit annually, just as part of their annual reporting process. We approve construction for new wells, new storage, all those things, conservation and efficiency is a piece of that, but I think we could do a better job of really focusing some hard questions of the utilities in terms of, is this need and could conservation and efficiency...

0:29:52.0 S2: Maybe in the long term, wouldn't remove the need for a new well or a new storage, whatever it may be, but at least could delay it for a period of time, that's good for the customers in terms of costs, and again, could serve some of the conservation efficiency benefits, we could probably do a better job of helping systems incentivize the larger users, again, thinking about utilities that have large customers that would maybe consider process improvements which would reduce their water usage. Again, it gets a little sticky. In turn, from PC side is using Rite dollars for a program like that. Is something that we would look at really hard and need to see a pretty positive benefit to think that a bunch of residential users should pay for industrial upgrades that would reduce the water usage, but there may be a case for that, but that... Again, that's not to say that we can't play the role as an educator and help municipalities see the benefits of that, or help counties or again, state resources, federal resources, identify those areas where helping cover the cost of some of the initial upgrades would produce long-term benefits for all parties.

0:31:27.4 S2: And then I'd say lastly, looking at areas where system partnerships may make sense, we've a ton of systems in Wisconsin, some very small systems and some very small systems that are pretty close together, so again, not that running pipe, three miles to connect the systems. This is the right measure, but what cost efficiencies? Could we help them identify his partnership opportunities, could they purchase chemicals and materials together, could they share an operator to those types of things that largely have been separate thoughts and they've totally operated as separate systems, that doesn't mean financially they'd be combined, that doesn't mean that they'd have some combined overlords. Are there ways that we could help them work together to see some cost benefits, because frankly, from the water equity side, while Milwaukee and Kenosha and some of our big systems get a lot of focus, and rightfully so, because those communities have serious burden issues in some small areas in some subsets of the service area or small systems, they're trying to spread the cost of the new well over 30 customers, many of which are low income in a small rural town or on fixed incomes, that's a really hard ass, and ultimately, they could end up drinking contaminated water for nitrates or other things for a long period of time just 'cause the cost to try and upgrade the system or those things, it takes a long time to do, or ultimately they decided to

disband the utility and everybody goes in private wells.

0:33:25.3 S2: So I think those are probably my four or five key areas where we could improve.

0:33:32.4 S1: So that was very informative on a wide range of a surfactant community outreach work on just specific code, and then issues with freight payers and tax payers and how that will affect their long-term quality and water quantity needs. One final question, more questions should we have asked that we didn't...

0:34:01.0 S2: And that's a good one. I can't give me... I think... You've got a big task. I'll give you that. I don't know if I shelve you my background, but I worked with their team for a number of years before coming over to the PSC, so I have kind of an interesting view of the Compact and now from the utility side, and it is... It's a difficult animal to wrangle, and certainly the conservation efficiency within it is incredibly difficult to try and get your hands around all of the moving pieces that could play a part in how you address that and... What are the specific requirements? Again, they're largely very broad and maybe not so specific, and I think each state has done something to try and address that, and maybe that's the right approach in the sense that they know their systems best, they know what the challenges are, and hopefully they're doing a good job with that. But yeah, I think what you've generally seen between the Compact states is a willingness to take a look at each other and try and identify areas where people are doing a good job and kind of mimic some of those things.

0:35:40.5 S2: So yeah, I'd like to say that they should all regulate their municipal water utilities like we do, but I think that's a tough ask, so hopefully they're able to collect similar data and do that, and it doesn't necessarily need to be through the regulatory side, like we do, but again, I think certainly finding ways to help them understand water loss from the utility side is really an important piece to the puzzle.

0:36:22.3 S1: So that really helps a lot. He does. Thank you so much, Mr. Hire for taking the time. It was a very informative interview and together with challis, we have a nice big picture, I was content, and I think there are areas forever you can advocate for in Michigan.

0:36:41.4 S2: Great, yeah, if you got any follow-up questions or or any clarifying things, please don't hesitate to reach out, I'm happy to try and provide some clarity in the grey world of regulatory authority that we can operate in.

0:37:01.1 S1: Jeff, did you have a question that you wanted to ask?

0:37:03.4 S2: No, I was just on a meeting so I could say thank you myself. I greatly appreciate the input. Yeah, no problem, we'll best of luck with the project and we value the work that you guys do as grad students for sure, and there's just a lot of great stuff that comes out that we certainly read... I remember my time there. I Ticino anybody care about... What we do here is grad students, but I can tell you from the other end, we certainly generally read a lot of what you do and take it that where we're able to try and advocate and apply for those things, so

thanks for the... Where they're put in.

0:37:48.5 S1: You so much you have a good rest of your week. Yeo.

Transcription

Interview 5

0:00:04.2 S1: So our first question, are there any areas where you feel that your state has excelled at meeting or exceeding the requirements in the compact in terms of water conservation and efficiency, and where do you think improvements could be made?

0:00:22.7 S2: Yeah, I think this was part of why I sent you guys to [REDACTED] as well, in that the Public Service Commission of Wisconsin had a really long history of having state rules and statutes that relate to management for public water systems. And so as a result, there's been metering reporting of unaccounted for water leak detection requirements... All of those kinds of things in place for a long time. I'm not exactly sure when they started, but probably even dating back to the 1960s, and so that whole set of stuff is in place, and there's certainly implementation issues, and there's always sort of ongoing efforts that can be improved, there's been some recent rule revisions for the PSC that, I think have improved what their water auditing requirements are, and people implement water audits to different degrees, but I think that's just been a real strength of... In the state, in terms of being able to come into the Compact and meet some of those goals and objectives. Write off the bat. I think we've also seen with plumbing code changes that just also had an impact on residential water use, and in general in the state, we're seeing that as being very flat to decreasing from the public water sector.

0:02:07.5 S2: I think the other side of it is, is that when you're in the Lake Michigan base and there's a lot of that water use, historically has been industrial, and the industrial demand has decreased also considerably, and the Lake Michigan Basin, and that's both from industries leaving and then also big shifts in industrial water use, for example, going from water cooling to air cooling systems, and so those are things... Some of those water use shifts, I think aren't necessarily attributable to any actions that we've taken, the PSD, that's certainly state government requirements. That certainly has a role, but some of these other pieces, I can't say we can take credit for the fact that people install toilets, sort of what you install uses less water and some of the industrial shifts... That just makes sense from an economic standpoint for those industrial systems to be more efficient, so that's just... I guess the takeaway there is I think that the state laws around public water systems in the PSD are real strength in Wisconsin. We've had some efforts towards working on improved efficiency with irrigated agriculture, so working with the university on some irrigation scheduling technology systems, and so they are...

0:03:38.6 S2: The ideas is that the farmers can use the irrigation schedule and they can

include... It includes weather data and include soil moisture data that they have, and so they can do a better job of targeting when to actually irrigate, and that's, again, all of our focuses on things being cost-effective, that there's not an interest in promoting water efficiency, that's not cost-effective. So I think that's a place where there's been some good efforts and... I think that's a good good piece. I think that's also I'll mention later too, but that's a piece that I think we can continue to work on. We've had some good success with promoting fix a leak weeks, we've had some to public campaigns on save water, Wisconsin, so historically, we were at the state fair annually and had water conservation and efficiencies displays there. There's been some changes to how much of a presence the DNR had at the State Fair, and then covid also influenced that, so that hasn't been the case in more recent years, but I think some of those efforts were very successful in reaching out and just continuing a message, that's just kind of important, I think to have in people's mind, and then one last thing I would say is that I think we've done a really good job of putting together a good data collection system, we had a really strong database, we've been able to build on that infrastructure, so just continually to build what the functionality of that is, there's online Water Use Reporting, which I think improves the quality of the data just in fewer transcription airs, those kinds of things.

0:05:47.2 S2: And we've always had a QA QC program as part of that, especially focused on the largest water users when you're doing any kind of aggregate data, the biggest water users are the ones that are most important to get, right. But as time's gone on, we've been able to add more checks into that data process, and I think the data collection... So as you guys probably know through the Compact that data collection is supposed to be reported annually for a monthly basis, and so the stronger your data are, the better you're able to analyze what water use trends are and figure out... We can talk more about this a little bit, but figure out some benchmarking kinds of concepts for different water use sectors where there's perhaps the most benefit from the State being involved in helping with water efficiency efforts. So

0:06:59.6 S1: Yeah, you touched on a lot of aspects there, and that was really, really great before moving on to the second question, which you've also started to address it, a one quick follow-up on the data, and you talked about... You talk about this more. What data you're collecting? Is it metering? Is it through water audits, what is the exact benchmarking that you're able to do?

0:07:25.5 S2: Yeshe, data that we're collecting is what's required in the compact, so it's what the water use type is, and we have things broken down quite a bit, how much water they're using on a monthly basis by source, and then what kind of how they're doing the measurement, so are they using a Water User meter? Are they doing at the time our meter... Is it... There are some sectors where it's just you figure out how many people you have using a you multiply times a standard rate. There's not a lot you can do with those kinds of data, although we may be able to use some of the other data to refine how much you should estimate somebody, if you say, Okay, I've got this many people working in an office... What's the right number for that? We may be able to do some finesse of those numbers, similarly with dairy, one of the groups of people just says, I've got 40 cows, and so you guys told me how much water a cow uses every day... I just multiply that out. But we've got other dairies that are on meters, and so

we may be able to refine some of those numbers using what the actual data are that we're reporting, that's what sort of the standard collection for the data.

0:09:03.5 S2: We've had some other projects to collect a little more data, we thought about it. So just to give you a little context, I've been involved in Great Lakes Compact implementation in Wisconsin since 2011 probably, and then even before with maybe 2010, but then even before with the Compact and through the ratification process and stuff, so I've done with the state since 2004. And worked on compact-related issues before there was a compact, and those pieces over that time, we've had different people who've been the water conservation point of contact, so I've been involved with that all the way along, but they've been... We recently, if you had made this call, set this up a year and a half ago, there would have been somebody else who probably would have taken the call, so we just recently have had some things shift around a little bit, but with some special projects... This last guy was working on some additional data collection in terms of looking at what crops people were planting, how many acres were planted for certain, what well was also trying to look at some golf course efforts in terms of being able to try and collect some additional data on that in that project never how these things are ongoing, ongoing efforts and we can talk about...

0:10:43.1 S2: Or challenges with some of these things. So I think some of those more specific things are more of a work in progress kind of thing, where there's the concepts, but there's not actually the same kind of long-term record of data just embedded in our system

0:11:02.4 S1: That it does a lot, especially just clarifying on the data, just to make sure. And then go right into the next question. When you mentioned about agriculture and scheduling technology, the second question, what sectors do you think have the greatest potential for improving conservation and efficiency, and how does your reports... Making improvements in these areas. It sounds like the agriculture scheduling is gonna be a big improvement and working with golf courses on the same aspect of when they're irrigating.

0:11:35.7 S2: So I think we're maybe in a similar position to Michigan of, Hey, what... We've done a first stage with compact implementation, we've got a lot of programs in place, what are our opportunities to move forward, and with the individual I mentioned who was in that water conservation role, moving on, that sort of... Always a good moment to say, Okay. What's working in the program? What's not working in the program where there are opportunities, so from the DNI standpoint, we really felt like the Public Service Commission is the place to take the league lead on public water systems, that they're well positioned to do that, they've got good things in place, and so we can certainly be supportive of that, but that that's kind of a sector they are in the best place to take a lead on, and then the only exception to that is for us, is that we work with Diversion applicants on water conservation programs and efforts to make sure, that they're fulfilling the requirements of Wisconsin's Water Conservation rule when they have those applications. And so with what the diversion applicants, we thought a little bit about benchmarks for residential water use or just for water...

0:13:01.9 S2: For public water systems ones, we're looking at right now, so these are things that

we've asked diversion applicants to report gallons per capita per day, max data, average day ratio, and then a residential equivalent units calculation, and so that's where you take every meter in your system and you multiply it by a factor to make it equivalent to a three-quarters and residential meter, and so you just sort of get a number that you can say all of our use is equivalent to this much residential use, and it's a little bit more like... It's just a number, but then you can compare on how you're doing in terms of water use over time, so those are three benchmarks that we're using right now and seeing if we think they're effective, and that's something I would like to see discussed at a regional level. Of in any kind of public water system, there's gonna be differences between systems and uses and one size doesn't fit all, but I think some of these benchmarks can be helpful in thinking about where do you fit into certain... On a certain range of uses and can you change where you are, what would the cost be, what would the effort be to do that? So that's just a little bit on the public water supply side, but in terms of...

0:14:47.9 S2: I think for us, the opportunities really are with irrigated agriculture, dairies and golf courses at this point, we've got some contact... This is what other work I mentioned on these schedulers and figuring out that and how to promote that and make that useful to the irrigated ad sector, we've got a lot of Irrigated Ag in Wisconsin, and that's also like Michigan and places where it is stressful to surface water resources. So working on efficiency in those locations is useful for the State's water resources, and then I think there's a bigger opportunity to do more data review, data synthesis, so just thinking more about who are our largest water users that could benefit from state support, and then where are their opportunities through the universities, I think in particular, to develop tools and develop outreach opportunities and frame things where it's useful for the water users.

0:16:11.9 S1: That leaves into a third question of what challenges or issues in your state, if you're, say, experiencing in achieving its water catering goals and objectives, and how are you overcoming these challenges? It sounds like the golf course is... It becomes a bit more... For gray area of really a public outreach, less so of the metering, who talked about the divergent... Where you have status.

0:16:40.1 S2: Yeah, so I think that comes into looking at both the combination of where can you have a significant impact, where do you have a group of people who are interested, and how much assistance can you provide... So that's sort of where I think we get into that data review, data synthesis, and then also partners at figuring out where there's good opportunities for partnerships that it's worth putting that effort in, and then that's when you talk about what are challenges that you're facing... You can have the best idea in the world, but if you don't have partners where it meets what they're interested in at this point in time, then you can spend a lot of time as a State regulator or not being particularly effective, and that's not... A lot of things is both getting the policy and the timing and partners and champions. Right, so just in terms of what the challenges are, what I've got for that is, we have competing priorities, we've had some extensive work to do on some of these diversion applications, and so that certainly takes time away from some of these bigger picture water conservation issues. We've also... Our program also works on high capacity while reviews, which is really looking at what impacts from water

withdrawals might be on natural resources, there have been some court cases, new decisions, changing authorities, so it just takes a lot of time and it's a really important priority.

0:18:25.3 S2: It makes a really big difference for a lot of resources in the state. And then we've also recently had a three-year study on the impact of groundwater withdrawals on three Sage lakes in the state, so again, a really big project, a really big time commitment and fitting into those issues of sustainable water management, but not directly focused on an efficiency standpoint, another challenge we've had is we've had a really wet last five years, so we've had really high high water levels, we've had a lot of ground water flooding, flooding from big rainstorms, and that from a standpoint of Just agency messaging to show up at an event. When you're talking about your big issues to talk about conservation and efficiency doesn't really resonate, it actually makes you look a little tone deaf, and so I think that's a challenge of some of these pieces of things of just when it's a much easier to talk about and get public interest in issues or get partner issues, if people are feeling water stressed, then if they're feeling like, Could somebody please take some of this water away? So yeah, that's kind of what I have as some challenges.

0:19:55.9 S1: It sounds like threading the needle and public one is a very hard thing to do, and leave to the next question as well. Are there any conservation initiatives that your state promotes that you think could be beneficial to other states, you've mentioned a lot about your public outreach, not just the golf courses, but going to the State Fair, we talked about going to meetings and talking about water conservation and residents like it can come off as tone death because people are saying flooding and people are saying other is going on. And it goes to your point you made earlier about the toilets, they're not thinking about exactly which new household items I need to put it in my house right now, especially if they're working. So it sounds like your public outreach might be very interesting to view.

0:20:45.3 S2: Yeah, so I... I think that the water sense programs are definitely worth promoting it, I think, I assume you are familiar with those, but EPA has got this water since program, they have a whole fix, I like we get a lot of that. I think that that's good when there's the individual public utilities that are doing that and those targeted messages towards their customers, but I think that even a state role and just... It's, again, one of those just ongoing messages of, Oh yeah, I should look for leaks, oh, I did hear my toilet running, Oh, I could do something about that, just kind of getting people information in their hands there when they might be able to use that. And so I think it's just good overall to promote those, and I think that EPA has done a nice job of making that pretty easy to pick and choose what's useful. We've mentioned the State Fair, but we've also frequently attended farm tech days in Wisconsin, so this is an annual meeting that moves around the state that focuses on farm technology and new opportunities, and we've had a DNR of and goes and has a presence, but we've also...

0:22:05.6 S2: The previous person in this position often went to those meetings and he brought along information about water use in Wisconsin, you dated a water use, and I think sometimes they've had presence with the UW in terms of the irrigation schedule. And again, I think that's been a place where it's an audience that we're interested in reaching and talking to about

efficiency, and again, when you can frame that in terms of a cost-effectiveness message and that resonates. And that's interesting to folks. So I think that's been a really good venue, and I think we would work to go to that kind of venue, maybe over the State Fair venue, just if we're looking at time and energy resources. I think we can have some more effect there, but I think that some of those public outreach efforts are definitely worth... While one of the hard things about those is that those are... You're in and you're out. They're not really lining. They're not really like, Okay, I did this and I completed it. It's not sort of sequence like that, it's kinda just ongoing, like you don't necessarily ever really make progress with it, you're just keeping the issue in front of people, and that can be a little harder to sustain over time within a program.

0:23:36.6 S2: That's sort of a challenge with it.

0:23:39.5 S1: Any other challenges or programs that I think would be beneficial, and it was constant. For other states, I kinda home in on public outreach, I wanna make sure you have the opportunity to talk about all your programs. And once they really find our successful...

0:23:59.7 S2: Yeah. There's not necessarily anything else I think of at the moment.

0:24:07.9 S1: So then it leaves into the fifth question, which programs and policies implemented by your agency, an organization, do you believe are most effective in supporting water conservation and efficiency in your state from environmental justice and water equity perspective, and why...

0:24:24.8 S2: Yeah, I think sometimes I've struggled with water use, of really thinking about, well, what does environmental justice or water equity mean in the context of some of these different sectors, so from a public water supply sector, that's a pretty easy thing for me to think about, making sure that residents and cities have access to high quality water, and a lot of those things I think of as being more of a water quality issue than a water quantity issue, now that's to say they could often be very much intertwined, quality quality quantity can often be intertwined but I think in our rural context, the equity issues are much more quality related, just in terms of impacts on private wells from a variety of pollutants. Again, I think the Public Service Commission, from a public water system perspective, and those are maybe still quality issues, leading service lines, bacteria, just aging infrastructure, all those kinds of things. With the Public Service Commission, you have, if a utility wants to put new pipes in the ground, wants to wage water rates, they have to go through that for that commission, and the commission is looking to make sure that what the expenditures are are in the public interest.

0:26:03.9 S2: And so I feel like I can describe that best by the contrast of... There's other places where utility can just set the rates whatever they want to act, and oftentimes you have poor communities which are using the water rates to support city government, so the water rates are high, but that water, that money is not even going to improve the infrastructure. So you just have these cities just get caught in a really difficult cycle where the utilities are charging money, but the money is not actually going to improve the infrastructure, so you have all the problems with poor infrastructure, you still have solved that in Wisconsin. It's certainly not perfect at all,

but there is this real role where you can't use the money from a water utility to balance a city budget, so at least there's those checks and balances that say If you're using money from a water utility that actually has to go towards water utility projects and it's run through sort of an assessment of, is that in the public interest for those expenditures? So I think from that standpoint, that's kind of... That aspect is important from a water equity component.

0:27:35.3 S2: I don't know if you guys have more examples or ways that you've thought about of what specifically your environmental justice or water equity examples are when you're talking about conservation and efficiency, and that might help me out with any examples from Wisconsin

0:27:56.5 S1: As... Well, you said before, sometimes at fine line between quality and quantity is very important to address something which I think is on our minds, we're researching from equality is where are the levels going down or necessarily where are they changing, especially 50es people, and how it does that influx what potential quantity flooding of areas affect wild rice, important crops and just the... They're into their culture and their sustenance that will be affected in different ways than a non-indigenous population, and so that's from a quantity standpoint of increased flooding in areas, not allowing... I am definitely not an ecologist or any scientist on that level to say How much matters too much, but I think that's one aspect where is the flooding happening and how the flooding affecting education in that that is important for Denis people's culture and sentiments.

0:29:00.9 S2: Right. Yeah, so I think those are good examples, I think changes in water level. So the areas where we've got wild rice beds and where those are, as far as if the understanding I have of it, it's not an area of expertise, it's certainly an area of interest, are in places that are not affected by urban stormwater run-off. So it's gonna be weather patterns that are really gonna affect what water levels are going up and down, and certainly climate change is a role in that, I think that starts to move outside of the context of a focus on conservation and efficiency. Climate change is really important. That's something that needs actually addressed, I'm not sure that in our context, that really is a connects to an efficiency and conservation message of how water levels might be affecting lake levels where there's indigenous use of the water, so certainly in Central Sands there is, but that's... Yeah, but I don't think that area that's got a lot of indigenous uses of their resources.

0:30:36.1 S1: So the next question is similar. Are there any areas where you feel your state has excelled in terms of water conservation and efficiency, in terms of evident in justice and water equity, or what do you think improvements could be made I...

0:30:55.9 S2: I think that really the place is helping to define what those concepts mean in the landscape of the water use that we have, so I think that's kind of the biggest place that could be helpful for us is figuring out how to apply that lens in the context of the water uses that we've got in the state, I think my answer for the last question kind of applies here as well.

0:31:30.3 S1: So what measures would you recommend be added to your state water

conservation efforts that are not already in place?

0:31:42.3 S2: Well, I wanted to mention in one of them, I kinda got to the end of the questions, and there was one other thought that I didn't have... No identified anywhere. So we don't have industrial water use on our list of high priority sectors to provide state leadership on a lot of conservation efficiency, and that's primarily because what we've seen is that the industrial systems generally have that cost-benefit concept for water use worked in... They've got economic drivers and they've got enough sophistication within their own user groups to drive that without the state providing a lot of assistance in that, so we see that where we talk to industries and we hear what they're doing for efficiency, we notice trends. We have conversations, we see what water use is decreasing, so it's more... I feel like our interaction with the industrial water use is more about tracking or understanding what they're doing, rather than that being a sector that we have a lot to offer beyond what's going on already in their own industrial groups. So that's just one piece I wanted to mention 'cause that's been our general assessment, and then I think that there's still plenty to do on those sectors we've identified as being able to have an impact, so it's more dispersed individual users that could benefit from information that's cost effective for them.

0:33:50.8 S2: And so what we have on that list right now is that agriculture, dairy and golf courses. But yeah, we'll see what else that... Metopes out

0:34:04.2 S1: There. So the one final question, what questions should we have asked you in this interview, kind of an open to maybe close a thread or go back to something...

0:34:17.3 S2: Yeah, I don't know what the question is. One of the thoughts that I have, and this is something I expect that Amala has mentioned that the compact Council has a science strategy, and water conservation and efficiency is gonna be the same for focus for that strategy for the coming year. And one of the things I think is a challenge about working on conservation efficiency in a Midwest to East humid environment is that so many of the tools and information are geared towards a Western Water arid climate. And so figuring out ways to make the information and conservation and efficiency be relevant and helpful in a human environment is something that I would like to see for us to work on as our region. And you have organizations like the Alliance for Water efficiency. If you guys were gonna talk to people outside of state government, I think a call to them would be a really good... Really good call to hear what they think folks in the Midwest... State agencies in the Midwest should be focusing on for promoting conservation efficiency, I think that'd be an interesting piece, but a lot of their members, the folks that have the financial pressure to really work on water conservation, iron arid environments, but then information about conservation that focuses on...

0:36:19.0 S2: Places where they're using 100 and the average is 120 gallons per person a day, and half of that is outdoor water use, that just doesn't translate to what we've got in general in a Midwest environment, so I feel like there's working on this stuff in the Midwest, it's a challenge to sort through what the conservation information that's out there and put it together in a lens of the human environment that we have, in the environment where you go

through these cycles of abundant water and you go through really wet cycles, and you go through drought cycles and there the messages are really more about being efficient with water from a standpoint that you're using excess energy to pump water, you're using excess chemicals to treat water, those kinds of things, rather than necessarily you have a consistent shortage of water, that's

0:37:36.8 S1: A very interesting... I think a nice place to conclude, thank you so much for your time and really talking to us about it was Constance efforts and water conservation and efficiency. I found it very informative, retief as taking notes and that's... He was a bit... I wanna make sure...

0:37:57.4 S2: Yeah, no, it's good to have a couple of people hear different things...

0:38:02.4 S1: Yes. So we'll follow up. I'm sure if you want the final report in a formal sense, it to you or I... We may certainly be interested in what you guys put together yet, so I'm gonna stop the recording. Ono.

Transcription

Interview 6

0:00:03.3 S1: So just to set a baseline, how familiar are you with the project that we're working on, or do you need an intro? I probably could use an intro... Yeah, great. So we are working with Eagle with Emily panel specifically to assess the current status of water policy in Michigan and then provide some recommendations moving forward on how best to add programs to help fulfill the needs of the Compact. So right now, our first step is to just talk to a bunch of people across El, across Michigan to get a feel for what programs are currently exist, and then we'll move into talking to other Great Lakes states and some other water age states and look at some federal programs to find solutions to fill any sort of gaps in programming that are identified from this first step. So right now, we're just talking to you to get a better handle on what currently exists, we've done a litter view of all of the existing programs, but it's been helpful to talk to staff on what your impression is, so I do have a lengthy-ish consent statement I do need to read to you for... You can get started, so I'm gonna go ahead and read that and then you can let me know if you have any questions.

0:01:17.1 S1: Okay, okay, so a few bullets to get through, so our team includes folks on the University of Michigan, all team members on this call will have access to the information you provide during the call. We will ask you questions about your current roller job as someone who works with water conservation, and we'll ask you about topics that we think are important, it should be measured specific to water conservation... Water infrastructure and related topics. Your participation in this interview is completely voluntary and you can stop participation at any time or refuse to answer any question. We'll be recording and transcribing this interview, we will summarize findings from this project in a report that will be shared with people working

on drinking water affordability across the student Michigan, and we may publish the results in academic publications. We plan to prepare report summarizing findings from these interviews, which may include electron quotations from the interviews, these data will not be linked or attributed to you or any other interview E and the report will provide a list of all the people interviewed, including name, position and organization, and you can ask questions about this project at any time during the interview, as well as after the interview by contacting us via email, so do you have any questions about these points or...

0:02:28.9 S2: Generally, the purpose of this interview, no, other than generally speaking, what's your timeline looking like as far as the loan documents.

0:02:38.3 S1: December is when our final report... Well, November, it will be submitted to people that's not much time on

0:02:44.8 S2: To give you guys...

0:02:48.5 S1: So we're doing our best here. We've been working on this since the beginning of the year. And so we've been doing Early Review and other goals, and we're just getting to the interviews now, but... Yeah, in December. And do we have your permission to proceed with this cane? Yes. Okay, great. I'll start with our list of questions. I'll just go through... I don't know if... Did somebody send you the list or have you not... Yes, I did glance at it. What it was said, but I haven't looked at it in any great detail, had an opportunity yet, so... Yeah, no worries, I'm just gonna go through that list and then we can ask Clare in questions as needed, but let's start with the first one, which should be which programs or policies implemented that you will contribute to the water conservation and efficiency in Michigan. And that could be specific to what you've worked with...

0:03:40.2 S2: Oh gosh. So I will only speak to what I'm familiar with, which are the ones that I directly work with, and this is gonna be on the funding and financing side, and I will say that there's probably not a lot of direct language that speaks to water conservation directly. There's some indirect language in our funding and financing programs, but there's a lot of water conservation efforts that take place within the program, their selves as far as... From a municipal standpoint? From a local standpoint. So only recently has EPA. So let me back track, the main financing program that I work with is a federal program that we also contribute state dollars towards, so we follow the federal requirements, and it's only been just probably in the past five years or so that water conservation has been mentioned. Having some type of tie to those programs that I work under on the financing side, and that would be... There were state revolving funds, so the drinking water... State Revolving Fund and the clean water. State Revolving Fund. Great.

0:04:58.6 S1: And which programs of those or voting else that you know, do you believe in the most effective in supporting water conservation and origins?

0:05:15.1 S2: That's a tough one. I would say they're both equally supportive in looking at water

conservation and efficiency purposes, but personally, that there's probably a lot more that can be done to support those types of activities. I think the overarching goal of the program is for making improvements to water infrastructure, and when you're making improvements current day, it's just innate that will improve water conservation and efficiency when you're making improvements to the electrical systems at a treatment plan or removing pipes and replacing pipes, with newer pipes that it's just innate that there is water conservation and efficiency issues that are resolved at that point, but there's nothing that specifically says we will only fund you if the result is water conservation or some type of energy efficiency type approach.

0:06:18.1 S1: And to follow up on that, are there areas that you think improvements could be made in that space as far as being more effective?

0:06:25.0 S2: I think so, there is language that allows for principal forgiveness, and forgive me, I don't know how familiar you guys are with either one of these programs, but there's federal language that allows for their loan programs, so typically the community comes in, they get alone, they have to pay that money back, it's a very low interest loan, there is language that says some portion of your loan may be forgiven, meaning they don't have to pay that portion back right now, in Michigan, we give that principal forgiveness away to communities that are considered disadvantaged, but there are opportunities there to say, If you have an energy efficiency project, if you have a water conservation type project, we could give you an incentive in order to come into the program and get money for that, and we currently don't look at those types of energy conservation practices in that manner...

0:07:18.1 S1: And I know you mentioned these two revolving loans are under federal program, are there any other stakeholders or groups that you work with to implement or create programs?

0:07:31.4 S2: Probably not necessarily on the federal side, so there's local stakeholder groups that provide input into how we're allocating the money, so they may say they want more money to go to this community or more money to go to this other community, but as far as generating new policies or new processes or new legislative language, it's mainly the Federal EPA that we work with. For those two programs, now, I do work a lot on the state side with state grant programs, we have a couple of them right now in place, but there's a... I'm sure you guys have heard there's a huge chunk of money from the federal level and from the state level, potentially coming down with new grant programs, so there's a lot of stakeholders there that run the gamut from local grassroots types and geo organizations, legislators, communities... Aww, a mea, the water organizations, those all have input in those state grant programs that are currently... We're looking at developing...

0:08:40.7 S1: Great, and which sectors do you think have the greatest potential for improving conservation and efficiency, and if applicable, how is El working with those sectors?

0:08:58.0 S2: So I guess, can you explain a little bit what you mean

0:09:00.1 S1: By sector... Yeah, we've heard some other interviewees, we're talking either the acceptor or domestic drinking water use or just like what... Where are the some opportunities for their stakeholder groups or water users that have a potential to save more...

0:09:18.7 S2: Yeah, so I think it's difficult to get all the stakeholders in a room and all on the same page when they're such varied interests, but there's definitely opportunities with some of these new grant programs to have some type of a work group or a stakeholder group, if you will, to help put together some of the guidance language for implementing these new grant programs... I wouldn't say that we work a lot with the Ag side of things, at least not my... Part of Eagle, we do more with public health type issues, so we do a lot of work collaboratively with DHS, the local health departments and stuff, and putting together new programs with them, so there's probably some opportunities to more coalesce with some type of ag issues for sure. It's been talked about in the past putting together a group with all of the folks within the State of Michigan that administer some type of a grant program having to do with water, but nothing really has formed from those discussions.

0:10:38.4 S1: Is there a reason why, or that just never came in

0:10:41.5 S2: Or... I don't think that there's a reason why other than... It depends on the timing, it depends on the political atmosphere, and as soon as one group is in place, it seems like the administration changes and then we have a change in leadership, they need to get the new priorities in place on this new leadership program. It's different people at the table, and there's a lot of reinventing the wheel then that takes places first couple of years with new leadership, so that's frustrating, at least on my end, for sure.

0:11:13.9 S1: And I know you mentioned that it's hard to get all of the different stakeholders in a room together because of different motivations, what are some, either big theme, intrinsic motivations or specific ones, essentially per sector that drive people to conserve water. You know what

0:11:35.6 S2: I think it's also hard here in Michigan when we've got so much water, and you look at some of the other states and that the lack of water is really what drives the conversations there. I think here in Michigan, what drives the conversations on conservation comes down to money, and how much does it cost to make improvements to infrastructure to treat the water that we're using? And obviously, the more you can serve, the less expensive it is for the local municipalities and obviously for the end user as well. So I think a lot of it comes down to money, and I think more recently, probably in the past five years or so, I've seen a lot more discussions with climate change too, and that being a big driver of conservation efforts.

0:12:27.3 S1: And what challenges have you faced in your position with implementing the programs that you do, if any... So

0:12:37.3 S2: The biggest challenge that we face is that the majority of the money that goes out the door from my group is loans, and everyone wants grants these days, they don't wanna pay

back anything, it's always someone else's problem to pay for and to deal with it, we get a lot of that to, well, we didn't create the problem and someone else's problem to clean it up. So those are some of the challenges. There's a lot of political challenges right now to even different communities are more Republican, more democratic, definitely at the state level, there's challenges with the budget process and getting money to implement some of these programs, depending on what side of the table folks are on these days, so those are the big challenges and hurdles that I deal with.

0:13:29.9 S1: Yeah, and you had mentioned that climate change has been more of a motivator in recent efforts, are there any opportunities you see in any recently passed climate or water infrastructure or energy laws or policies for water conservation to be switched in there?

0:13:47.6 S2: There's probably definitely some more opportunities, I think when new legislation comes down, that's an opportunity to put a language and they're related to climate change. I think the biggest, and this kind of sad to say, but the biggest thing that drives people to make changes like that is to experience something bad, just like Flint right? Now we have all this money for a leading copper replacement because of what happened to In plane, what happened in Southeast Michigan with the flooding and the basement backups, as long as that continues to happen, then the legislators will come together and put more money for those types of challenges. So it sounds horrible to say, but once something bad and catastrophic happens, that's I think a motivator for making change too, and there's a lot of talk... Everybody knows it's an issue. Everyone talks about it, but I still would actually, until there's water in your basement and people are screaming at you to make some type of change, that's really... When it happens. Yeah.

0:14:52.1 S1: We've heard that a lot of the... Yeah, and do you have any... Are there any gaps or opportunities you see for future programming in your direct area or outside of it? I don't know.

0:15:11.6 S2: It's kind of... We're kind of in a... I'm a little jaded because I'm in a situation where I feel like we've been talking to talk for a long time now, and there's not any action behind it, it's like, Well, let's put a... Let's put another work group together and talk more about it, let's put a council together and talk more about it, where at this point I'm like, Okay, let's put something down on paper, let's make some legislative changes, let's implement it, and if it's not the right thing, let's let's redo it again, but it's super frustrating right now just to keep talking about things and you keep talking about things and actually not implementing anything, and here at Eagle, the challenges that we have is we are here to enforce and follow the legislation, so even if in my program, we've internally put something together for water conservation and we'll say, Okay, we're only gonna give X number of points to a community that's doing what our conservation efforts and well score and rank them higher. There's always gonna be that community that says, Okay, show me where that's written in the law as to why you're doing it, so unless I have something that's written in the law, I can't back it up.

0:16:26.7 S2: And that's kind of the problem that you run into for a regulatory agency like us, there's a lot of great ideas, but we can't always implement them even if they make the best

sense for everybody because it's not written in the law.

0:16:42.8 S1: Yeah, so I guess... And you mentioned similar barriers, I think just with convening ag, so would you consider the biggest barrier is just this... The legal backup is not... Is that your biggest barrier to implement new programs or... Coming up with new ones.

0:17:00.2 S2: Yeah, for sure. I think the legality of it and the policymakers makers... Eagle is not the policy maker, we may come up with ideas and try to get them through, but we have to wait for the legislators to actually make those... Those laws essentially, right. So that's really the biggest hold up, I think, politics.

0:17:29.1 S1: Alright, are there any... Those are most of our content questions, but are there any publications or internal research or anything that we should be directed to to help us understand a little more about what you implement... More familiar with the revolving loan programs. Okay.

0:17:45.3 S2: Yeah, if you're familiar with those programs, probably not...

0:17:51.3 S1: I don't know, are you looking mainly at Michigan... Are you looking at others? So yeah, so we're starting is Michigan, but then we're also taking... We're looking at other states too, so we're gonna start with other great late states in the compact, and then we'll move to a few other water-rich states, not... Yeah, yeah.

0:18:07.4 S2: That's what I was just gonna recommend is reaching out to some of who our border states that are... They have the same challenges that we have. And the same amount of water. Yeah.

0:18:18.4 S1: Alright, and is there anything that we didn't ask that you think is important to convey? Or any final thoughts on your end?

0:18:27.0 S2: No, I think, like I mentioned, it oftentimes all comes down to money, money is the driving factor, and who gets the money? Who squeaks the loudest? Sometimes those are some of the big challenges that I get irritated with on my end, so money and the legislators across the street up draft is... Or anything I missed that you wanted to ask? No, I think you got to know.

0:18:58.6 S1: Okay, thank you, Kelly, so much for your time. We might follow up via email with any clarifying questions, if that's okay with you, but otherwise I'll look out for our report in December.

0:19:10.6 S2: Alright, thanks, color, I appreciate it.

0:19:12.8 S1: Yeah, thank you so much. Okay.

Transcription

Interview 7

0:00:02.3 S1: And before we begin, is there any additional details or background for our project that you need from me before we get started?

0:00:10.7 S2: No, I think the only thing I was worried about was, hopefully I can answer all of your questions and give you some good information for your research that you guys are doing.

0:00:20.4 S1: Yeah, that would be great. And if not, we're hoping to talk to everyday people, we're getting some good feedback so far, before I jump into questions, I do need to read a consent statement per IRB approval. So I will go ahead and read that and stop me if you have any questions as I'm reading so... Alright. Our team includes folks from the University of Michigan, all team members on this call will have access to the information you provide during the call, we'll ask you questions about your current role or job as someone who works with water conservation or an organization that is working on issues related to water conservation, we'll ask you about topics that we think are important and should be measured specific to water conservation... Water infrastructure and related topics. Your participation in this interview is completely voluntary, and you can stop participation at any time or refuse to answer any question. We'll be recording and transcribing this interview, we will summarize findings from this project and another report that will be shared with people working on drinking water affordability of prostate in Michigan, and we may publish the results in academic publications. We also plan to prepare report summarizing findings from these interviews, which may include illustrative quotations from the interviews, these data will not be linked or attributed to you or any other interviewee, but in the report, we will provide a list of all the people interviewed, including name, position and organization, you can ask questions about this project at any time during the interview, as well as a...

0:01:46.7 S1: Orientation, do you have any questions about any of these points?

0:01:52.9 S2: Nope not right now.

0:01:54.1 S1: Great, and we have your consent to move forward. Yeah. Alright, great, so we'll just start off rather broad, So which programs or policies implemented by your department contribute to water conservation and efficiency in Michigan?

0:02:12.7 S2: For the purpose of this interview, I think I'm gonna focus primarily on our Energy Services Program that we have, and so for our roles, essentially, we're looking at the water energy nexus in terms of like if we fix leaky pipes or you replace equipment with more efficient equipment that it's pumping less water processing and cleaning with water, which will result in the need for less energy, and so we provide programming to businesses and communities across the state, and we're trying to ensure that we incorporate these water conservation kind of information as well as with our Energy Information

0:02:55.6 S1: Along those lines. Is this where you think... Sorry, is this the program that you believe is most effective in supporting water conservation or is there something else that you wanted to add to that?

0:03:12.2 S2: Yeah, no, I think making that clear connection between energy and water, 'cause it's not just water that we're saving, it's the energy with it, and so it's kind of like the kill two birds with one stone. So by incorporating the water savings with the energy savings, it makes for a stronger case for some of this... So for example, one of the projects that we just actually finished up and we have a final report on, which we did send to Emily that's gonna be in that report that she's working on, we were actually trying to find the calculations in an identifying... Of all the service lines that we have through Michigan, what's the estimated number of leakage that we would have in those pipes and based off of the pressure and the amount of water that's going through there, what are some actual metrics in terms of kilowatt hours and Galland waters. And so it's... What we found was that essentially, the leak throughout the state results in about 21 and a half billion gallons of water we student of pumping out through these leaks, and the amount of energy that's needed to pump that water through those types and wasted is 52 million kilowatts of electricity.

0:04:25.0 S2: And then so when you add in the funding amount that's required for that, so it's making that clear case that we need to address some of these water issues in order to save energy, which was less of a burden on the grid, which means we'll have to produce less energy. If we can address some of these other issues.

0:04:40.5 S1: Great, yeah. And are there any areas that you feel in addition to this, that Michigan has excelled in terms of water conservation and efficiency, and on the flip side of that, are there areas where you think improvements could be made?

0:04:56.2 S2: So I'm gonna take a side on that one, I've only been with the state for about three years, I'm not as familiar with all of the projects and programs that Michigan is put in place for water conservation efficiency, and since energy has joined Eagle prior to this government we were under law or licensing and regulatory affairs, we've partnered with the Offices of Great Lakes for partnering with the clean office of clean water public advocate's office, and then we're incorporating water in... So I feel like just within our own little office, within the last year, we've made some great strides in trying to do some pilot programs and some outreach out there, so I'm not as familiar with all of the other programs in terms of moving forward, I think there's always more work to be done. There's always areas that we could improve on, and I think the nice... And there's a lot of collaboration that's happening between different units to see how we can not only our own program forward, of course, how we can reinforce other programs that are out there, like for example of this water energy nets pointing out and connecting the dam between the different connections of our various programs.

0:06:10.5 S1: Great, and which sectors or stakeholders... You just mentioned different units that you guys all work together, are there external sectors or stakeholders that you work with to implement or create programs...

0:06:26.0 S2: From our side of things, the ones that we probably work closest with would obviously be the utilities, and then the various communities as well, that kind of control their own utilities and different resources that they have.

0:06:38.5 S1: Great. And which sector-speaking sectors, meaning municipal plans, residential use, etcetera, do you think have the greatest potential for improving conservation efficiency? In opinion? Yeah, or from an organizational standpoint. Anyone that you're working with specifically, or your first politician... Open to all.

0:07:03.9 S2: So the ones that I'm directly involved with are really targeting as a municipal level and how the municipality can work on their own water conservation in their own water infrastructure, as well as what are some, maybe some outreach that they can do within their residents to try and encourage conservation, that's kind of our biggest influence area that we have... The ad one is really not handled by our Amy area, so I'm not sure in the one

0:07:33.9 S1: What are the individual motivations and incentives within those sectors that you work with that drive water conservation and efficiency?

0:07:47.3 S2: From my perspective, it's the desire not only to be better stewards of our resources, but also it's the bottom dollar, right, if I do these things, then I save my money and I can re-invest those dollars into other areas within my budget, so it's just that common sense, it just is being good stewards of our resources, both in terms of the natural resources and the funding resources available to a community.

0:08:15.2 S1: Great, yeah. And what challenges or issues have you had... You say, Excuse me, of a baristas. Alright, yeah, what holes have you faced in implementing the programs, policies, initiatives, and have you had any opportunities to overcome those challenges?

0:08:32.7 S2: Well, I think the biggest challenge is always, which fire do we put out first? Right, there's so many things that communities and businesses are dealing with across the scale, whether it's dealing with the pandemic or it's dealing with budget short calls or whatever it is, it's hard to prioritize the things that we know we need to do when there's... Things that kind of has to be taken care of first before we can address those, and I think one of the ways that we're trying to do that is by providing funding to communities to help address some of those issues, because if you don't have the funding for it right now, obviously, you can't address whatever issue that is, but if you're given funding to address that specific issue, then it makes you able to prioritize it within your daily normal structure, and in terms of what your organization or your community will fund for that given year, so we found that that's been actually really helpful in helping communities kind of prioritize what they need to work on, because without the funding that they can't mark all the resources to support it, so if they've got that funding, then they can put some support behind it.

0:09:38.2 S1: Sure, yeah. You see it that I interpret what our restructure policies to advance,

what conformation that could be broad, general legislative initiatives or very specific or Nestle. Is that my incorporate water yet?

0:09:54.1 S2: Taylor, you cut out there a little bit in the beginning. Could you repeat the question?

0:09:57.9 S1: Of course, yeah. Just asking about which opportunities you see with any new energy, climate sustainability, water infrastructure or policies to advance conservation, so that could be direct, like anything new and upcoming, that directly address conservation, but also anywhere that you kind of shoehorn in water conservation with those other areas.

0:10:18.8 S2: Yeah, and I think for this, it kind of ties into our conceit Communities Initiative, which is essential, taking all the areas that a community has control over as a local government and connecting the dots between whatever that area or topic is to climate, to sustainability, to resiliency, so it's especially hard in Michigan, with all of our water resources that we have, that it's an abundance of water, but it's trying to help people connect with them for why we need to conserve that and treat it as if we only had a cuckoo water and we were in a desert. Right, so you gotta value that water and be really good stewards of it and not wasteful because there's an abundance of it, and so trying to connect the dupin, how water conservation can help our climate goals and help our de-carbonation hole. That's really the... The fortunately set my office is taking, and for us, it's kind of ties back to that water energy nexus, if you save water through fixing leaks and something less and using water conservation equipment, water efficiency equipment. And you're using less energy, using less energy means you're reducing your carbon footprint, so that leads to a path decapitation, and so it's trying to reinforce that and connect those dots and make it more attainable for communities to do more quickly.

0:11:39.8 S1: Or you to mention that's largely from you also talking more on education, what does the mentoring... Not there, a little bit.

0:11:49.6 S2: But yeah. So it would be, it's funding and then it's technical assistance as well, whether its webinars or FAQ or case studies that we're providing, or research papers, things like that.

0:12:04.8 S1: What do you see caernarfon or outside of your current program area in relation to water conservation...

0:12:13.6 S2: I don't know if you're on Tyler, I can't hear you too. There we go.

0:12:21.4 S1: Okay, I've been to...

0:12:23.0 S2: Don't Know What To apathy opportunities for future water conservation for and that completely go out sell... I don't know if you wanna just try and call me directly since it's just us... That might work too.

0:12:39.1 S1: Yeah, I'm happy to do that. I would be a ring just so at... My phone number is from Florida, I

0:12:47.3 S2: Mean, 'cause I know we're trying to record the... Okay, sounds good. And I think you have my number, but is not er.

Written Responses
Interview 7

1. Which programs/policies implemented by your unit contribute to water conservation and efficiency in Michigan?
    1. Energy Services provides grants to various entities for the purpose of energy efficiency, saving water saves energy
2. Which programs/policies implemented by your unit do you believe are the most effective in supporting water conservation and/or efficiency in Michigan? Why?
    1. All of the energy technical support programs are designed around the best practices of energy management, and using a tracking tool such as Energy Star Portfolio Manager (ESPM). Part of energy management includes tracking water usage, and ESPM has a section specifically designed for water. Through the continued outreach to grantees and stakeholders we emphasize the connection of saving water will also save energy, reinforcing that the two go hand in hand and are connected.
3. Can you describe your role in the Business RETAP program and the MI Clean Water Plan? What other water conservation programs are you involved with?
    1. I do not have a direct role with RETAP. Other water conservation programs that I am involved with is in partnership with the U.S. Department of Energy (DOE) Sustainable Wastewater Infrastructure of the Future (SWIFt) program. DOE recently launched SWIFt Phase 2 to work with water resource recovery facilities and further accelerate a pathway toward sustainable infrastructure. SWIFt Phase 2 will continue the momentum of SWIFt Phase 1 by leveraging the tools, resources, and lessons of SWIFt to benefit the broader wastewater sector. SWIFt Phase 2 goals include:
        1. Engage 100 additional facilities in a voluntary partnership to achieve 5% short-term and 25% long-term facility-wide energy savings, and
        2. Work with 25 facilities to implement at least one next-generation technology (e.g., renewable energy, resource recovery, and advanced data management).
4. Are there any areas where you feel that Michigan has excelled at in terms of water conservation and efficiency? Where do you think improvements could be made?
    1.
5. In our last interview you referenced a study that quantified energy savings accomplished by addressing water service line leaks. Is this study published?
    1. Yes, the study is published and attached.
6. What sectors and/or stakeholders do you work with to implement or create programs?
    1. Sectors and stakeholders that Energy Services works with to implement and create programs include businesses, local governments, non-profits, trade organizations, utilities, post-secondary institutions, federal agencies, as well as other State agencies.
7. What sectors do you think have the greatest potential for improving conservation and efficiency and how does your unit work towards making improvements in these areas?

    1. I think the local governments and businesses have the greatest potential for conservation and efficiency, and Energy Services continues to offer grant programs and technical assistance to these groups.
8. What are the individual motivations and incentives within sectors that your unit works with that drive water conservation and efficiency?
    1. Not only to save money, but to be better organizations/communities that are responsible for their use of natural resources and to be more sustainable and resilient.
9. What challenges or issues has your unit faced implementing water conservation and/or efficiency programs and policies? How are you overcoming these challenges?
    1. None.
10. What opportunities do you see with new energy, climate and water infrastructure policies and programs to advance water conservation in Michigan?
    1. Opportunities to inter-connect water with energy and climate goals.
11. What do you see as gaps or opportunities for further water conservation programming within or outside of your current program area?
    1. I see continued opportunities to promote water conservation when working with grantees on energy grants, saving water saves energy, as well as connecting stakeholders to additional resources and other programs (such as SWIFt).
12. Are there any white papers or publications in relation to the programs that we discussed that we should read?
    1. Attached, this is the report that was done on the Water Energy Nexus.
13. Do you have any contacts that could provide more perspective on the topics we discussed?
    1. None at this time.
14. What questions should have we asked that we didn't?
    1. None at this time.
15. How are utility and non-utility consumptive uses tracked and then reported to the state? Are there consumptive uses that are not tracked well? Are there opportunities to make improvements in tracking and reporting consumptive use?
    1. Energy Services collects data from grantees (businesses, local governments, non-profits etc.) at the end of a grant on kilowatt hours saved, reduction in electricity consumption (megawatt hours per year) as well as reduction in water consumption (gallons per year) related to the project completed through a final report that the grantee completes.

Transcription

Interview 8

0:00:00.0 S1: So I

0:00:01.4 S2: Just gonna jump right into a sensor running at a time that... Are there any areas where you feel that your state has excelled at meeting or exceeding the require... Sorry, wrong. As to one question, web sections, do you think have the greatest potential for improving conservation and efficiency, and how does your state work towards making improvements in these areas?

0:00:27.9 S1: One sector... What's the question? Yes. Well, I think all sectors ultimately

contribute to conservation every... Primarily, I think we focus a lot of energy and time and for good reason, on municipal sector, I guess it's subset of that being industrial or ITI... Industrial, commercial institutional sectors or CII, sometimes you hear it. The agriculture certainly has a role to play in efficiency, although there's some challenges there, and it's not necessarily a one-for-one, but certainly I think on the municipal side, there have been huge advancements over the years where we've seen conservation play a pretty big role in offsetting population growth, a lot of that on the indoor side of things has come from fixture replacement, I think rate structures, conservation messaging also play a role, outdoor landscape transformation is certainly a huge outdoor uses a lot of those water, depending on what numbers you're looking at, I think roughly half or 60% in some cases. And that continues to be a challenge on all fronts of that, so I think that that is continuing to be a big debate moving forward as we look out at future analysis of just what our needs are in the state, we can continue to see trends of population growth and climate change being perhaps two of the strongest signals of what future water needs will be, and conservation being one of the strongest solutions in helping reduce future knee.

0:02:13.8 S2: Thank you so much. So since we're... We haven't looked at it at the Conservation Water Board, but are there a conservation initiatives that your state promotes that you think could be beneficial to other states, and we understand there's different water laws in terms of water rights, in terms of Colorado and Michigan, but for Colorado.

0:02:37.9 S1: And I think the other aspect there isn't just the water rights component, it's the States role in a lot of what we do in... Even when we're talking about those municipal discussions are arguably, if not, we have a kind of influencing role or we can help potentially some programs, for example, we have this Colorado water to last initiative now that's really aimed at helping people understand really a deep dive on water loss methodology, using standards to better get a handle on the water loss, and water loss is one piece of the puzzle, but on the other hand, other things that I mentioned, like rates are outside of our control to influence outreach efforts, are things that we can help with that you see utilities and great example in our own backyard, Denver Water, having historically, I think, led that charge on some really creative marketing campaigns that change minds. We do grant-making that plays a role, especially in terms of promoting the presence of water efficiency plans or the presence of drought plans and an agency and providing money to support that and to support maybe some ways actions that come out of those or having strings attached to them needing to have an efficiency plan in order to get additional funding for municipal projects of that kind, so there's some things like that that allow it to influence, and there's another bucket of things, I suppose, are things the policies that ultimately maybe even lead to legislative change of things that we have a perhaps supporting role in the can directly lead.

0:04:22.4 S1: But when I think about things Horace, I think about things such as the EPA-Waterson kind of standards were approved recently a couple of years back in Colorado, in terms of that, the only pictures that you can buy, that's ultimately a legislative change. So we were supportive of that, but again, we can directly lead the way, there's things that we can suggest a need for, so for example, we have how still 05 from 2005, 1051 housed the municipal

reporting and conservation reporting database. And so we also have some data that we can track on what municipal uses you can do back-end out GPC from that, from all the questions we have. But again, these are tracking and supporting efforts, bigger things, at least in this day, we don't build projects like other states might fill at CCB, we're not like a California, for example, where they might have projects that they're actually creating, we have a role that may be shepherding or supporting projects in that... Largely true for conservation efforts as well.

0:05:36.9 S2: That was a very informative answer, thank you so much and I'll send you for generate very good in scenario planning as well. For jobs, could you elaborate on your water loss program that you mentioned, and community outreach that you've done on conservation...

0:05:56.4 S1: Yeah, sure, let me address the first thing to you, so scenario planning is something that we've really embraced in the Colorado water plan as well, now on some level, the Colorado water plan is probably the biggest marketing tool that we have, like the presence of the plan, uniting people under a central banner, giving recognition to all these big sectors, putting Ag and many and environmental needs on equal footing allows a space to talk about these things and talk about the inherent impact is even things like conservation and the need for that to keep Ag and production, for example, or to keep rivers and rater and rivers. So there's a lot of benefit to the water plan itself, and perhaps the most on any given day, one of the most important things that we do, that said, the scenario planning piece of that is kind of embedded in the analysis that we've done, so when we look out at the future, and we're looking at future water needs, we know that most challenge climate with the highest population is offset by conservation because we have scenarios built around that, so our second highest scenario that has equal conservation, equal population growth, but has a much deeper embedded use an ethic around conservation, it shows significant decreases in future water needs, so that information you can find...

0:07:22.8 S1: Were in the process of updating the water plan that you can find all that information and the technical update that we put out in 2019 on our website, it's called the analysis and technical updates to the Colorado water plan. So now back to your question on Carter lost initiative. It's a new initiative, it's our second year running... I think that... Again, when you talk about this marketing, we're not... It's nothing compared to them or water in terms of what we can even reasonably do or the staff that we have, we have one person, I currently would just change that to two people and maybe we'll get a third, but still for all of the state of Colorado, we have roughly a million dollars, I think, set aside for this current effort, we're partnering to provide trainings across the state, spread that out regionally, allow utilities to either come to an advanced effort because they went through the first training or for this kind of secondary effort where it's a little deeper diverse, it's their first pass, I should say. So they've either gone through it before and we're kinda giving them a deeper dive or they're new to it again, and we're opening up some opportunity around that, by the nature of us just being one agency, how many people were gonna be able to bring into that or how many utilities? I'm not remembering right now or titles, but we might be talking 100 utilities, but I think what's striking about it is that...

0:08:48.5 S1: It's just one piece of the puzzle. I think water loss is so critically important, if you're a utility, it's critically important everywhere, but it's so important and disproportionately important maybe... So what you think about it, if you're a utility that is just leaking, like I said, if you got 30% water loss, that is a significant chunk of the water that you're bringing in, and it's really a part of your immediate solution set for resilience and sustainability if you're a utility that 5% water loss, there's always some percent water loss, you may not even be able to get it lower than that, it's a piece of the puzzle that you wanna continue to manage and maintain. So that initiative, I think is important. I think it's equally important to put that in perspective of all those other things, the legislation I talked about that past, for promoting a lower standard of fixtures, faucets and fixtures and shower heads that arguably on its own will have a more significant in terms of total volumetric difference of impact in the state in terms of saving water, so if you look at a natural replacement rate of a toilet of 20 years and you can only buy something more efficient, the most efficient...

0:10:06.6 S1: You're significantly doing... Your ROI is significantly greater than something like this initiative where we're putting a lot of dollars in or doing a lot of deep dive training... Absolutely a great thing. I think the future of that may be really looking at targeting it to the utilities that need it the most, and that's hard to do, as some of the utilities that need it the most, the ones that might have that higher, 30% water loss are honest in the utilities where you got one person wearing multiple hats, they might be cash draft or time trap, and so getting to them and getting their time is arguably harder, so I think not to it all... Put down what we're doing, I think we're doing some great stuff there. But it has to be coupled with all these other things, these discussions around landscape change, these discussions on more efficient fixtures, just a deeper understanding and appreciation of water, like the outreach and the value of water, and the cultural ethnic to not waste the water. All of these things have to be Daiichi together to make significant impact, and some of those things are most impactful of almost touching on your affordability issue when there's a price signal attached, so in rates...

0:11:24.6 S1: And again, we can't do anything around this, it has nothing to do in some ways with an education campaign or something that the state could lead on, but certainly I think it's clear that utilities that have a tier grade structure can send a stronger price signal to the most wasteful users, and as a point of affordability and equity, I think one of my past physicians work in the city of Boulder, we had a tier grade structure where you're paying five times of the base rate in black five, but if you're using below the rate, there's actually, almost like a discount rate rates are incredibly hard to manage, they're hard to manage with software programs, some of that's getting better, but the more complex it is inherently the Harris to manage, but it affords you some greater tools and some signals that you don't have... When you're not doing that, so all these things coupled together, and for a state like ours where we can only do so much, we're really leading in partnership with other groups that are out there helping present these messages to... Including NGOS that are out there doing their own work in this space...

0:12:32.2 S2: Thank you, you so Machiavellian. A multiple different fronts, especially scenario planning and outreach and working with utilities that are strapped for time and people, it relates into our next question, what challenges or issues is your state experiencing and

achieving its water conservation goals and objectives, and how are you overcoming these challenges as a quick preface, I understand when we look to reach out to you and create these questions, it was before the Colorado River, New stopping points. I'm sure that affects this answer, but if you're able to talk about in other ways that will be very much appreciated...

0:13:17.1 S1: Let me just repeat back in here, basically, what is the biggest challenge and conserving water, and maybe as that touches on larger issues around the Colorado River is at it. Yes, I think that's a good question. The biggest challenge is in conserving water, I think it is the complexity of all those things, I think on some level, I know this sounds pretty basic, but it's the fundamental disconnect of how we're connected across sectors, I think people still struggle with understanding that when they're using water in Denver, if they're using water inefficiently, they're wasting or an utilities certainly for the large part gets the average public, I think don't always connect the dots between... So what I'm using more water or even if I have to pay for it more, maybe it's okay to do that, but they don't realize that that is the kind of thing that leads to drying up forms or the kind of things that goes to not being able to fish in the rivers they wanna go recreate in because the water flows are so low that it can't sustain life, all of these things are intricately connected, so I think one barrier to create greater action is helping people connect dots, and I think that there is something to outreach campaigns and messaging that can kind of look at that and it certainly...

0:14:50.1 S1: Now, this touches on your Colorado River piece, because in a year like this, where we have a very unique drought situation, I think the like of which is pretty historic for Colorado in the West, so is it pretty dire out... Maybe not as much in this specific moment is earlier this summer, but still in very deep grout, and then at the same time, I think here in Denver, we got one of our weeping on record, so this drought wasn't felt equally across the state and the way that it might have been in, for example, like 202 to 3 or in early 2012 to 13. So that makes that issue, I just noted, harder to translate because people aren't feeling the pain, but when you go to the last Sloan, you've got people that are losing their livelihood because they can be a river raft guide or they can't be a fly fisherman this year, they're getting cancellations, the reservoir so low that they're having to close down their recreation season early, you have cascading impacts from other issues like fire, mud slides or mud due to fire and run off for the little rain that has happened that complicate those things.

0:16:05.7 S1: So somehow helping people see that we're in it together, I think is a piece of that, so it's always like the challenge, and I think even on a youth education side, energy, housing issues, there's just so many issues buying for our attention and water is not always one of them, so things that we've done to increase funding for water in the state, the proposition BB that allows for sports bending to go fund the water, things like that are in a way, and in essence, a bit of an education campaign and bring money back that we can then do things with... We can provide grant funding to do things, but what are the things that we're gonna do it? I think one of the things that we're maybe struggling with, especially in grant funding, is we could fund anything that comes to our door, or is there some kind of thoughts that we need to have to really attract the kind of projects you wanna see... We've been in this big, deep planning effort with the basins, there's kind of these stakeholder groups called round tables, they've all been

planning and drought to huge issue this year, they all know it, but I don't know that specific projects that they came up with were always the right.

0:17:21.1 S1: Ones that we're gonna meet this need or make a change, I don't know that many were talking about conservation specifically for example, but there are a lot of projects came out because the farmer knows that they have to replace their aging head gate or they know river flows are low here, and there could be some action around a stream management plan that would help improve that, so I think somehow those challenges, and there's probably better examples, but that's what immediately comes to mind to me is that in this year were drought in Colorado River issues lineage. And in this year where we're doing a ton of planning, I'm not sure that everybody feels equally, that everybody knows the immediate solution set, when you talk about climate adaptation, a broad term, I think it widely gets wrapped up in climate mitigation and things around energy and GHS but doesn't always... We have some work to do to translate what does true adaptation look like, conservation is one of those pieces we know we're gonna have to conserve, but we can't conserve our way out of it, so another challenge, I think is... It's like that, Well, if I can't solve the problem, I can't do anything.

0:18:29.4 S1: There's a little bit of that fatalistic thought in there, do I think at times, but it's just like conservation has a sweetest thing, is they're gonna be the solution, Colorado solution are connected in a suite of solution sets to some of that storage, so that conservation... Some of that is probably down to just how we utilize our outdoor resources, how we fund things, these things are all gonna have to work together, and increasingly work together as people, as agencies, as leveraging buckets of funds for us to do any number of things, of which conservation is one.

0:19:12.6 S2: Thank you so much for the answer of... I know I'm going a bit fast. And I wanna be wary of your time. Go upper book. I have one more question.

0:19:21.1 S1: No, thank you. And I'm gonna text this other person real quick, I reinstate have running late. So

0:19:26.8 S2: The last question, what programs and policies implemented by your agency or organization do you believe are the most effective in supporting conservation and or efficiency in your state from Environmental Justice, Water equity perspective. Understanding that you don't look at Rate structures, but for looking at a conservation quality perspective...

0:19:52.9 S1: A really good question, and again, on social justice specifically, I know one of our sister agency to do more on the water quality side and work more directly in many cases with utilities, at least on drinking water issues, Colorado Department of Public Health and Environment. Joel minor, is there a person there who's working on social justice... This is an issue that is one that is timely to embrace, and it's one that I've been thinking about for a long time, just in a large context of the water plan, what the water plan looks like, what our stakeholders look like, and recognizing that we typically... In our world, deal with about 400 stakeholders on average, 30 frequently, but we live in a state with millions of people that are of

all stripes, a beautiful context of cultures and backgrounds that we need to recognize, and we know that some of those communities, especially when we're talking about the most challenge hydrology, worst case futures, they're gonna be disproportionately impacted by this kind of future that we're seeing in these scenarios, and so we need to do... Embrace this ethic. Now, we have started a water equity Task Force, which is honestly a first stab at surfacing some of these issues, whether that's just EDI, equity, diversity, inclusivity issues or social justice, but just broadly, how can we build in and give a nod at a minimum, and maybe even set some action around next steps of how to embrace equity in the water plan, so I kinda go back to the talking point I said earlier, the water plan is probably one of our greatest tools to effect change.

0:21:50.4 S1: Part of that is, I would say, relentless commitment to stakeholder engagement, the first water plan got 303000 comments, and we've basically been planning ever since, and planning and engaging with stakeholders every son ever since, and this new equity taskforce is another vein of that. So I think we've outlined for the water plan update, there is this component of saying, in part of that, the four buckets that we're looking at, so that loosely fall into cities, farm streams and then planning, that part of that planning is a commitment to EDI issues and as an agency, and maybe this more directly touches on your question, there may not be as much in that space that we can specifically do, a lot of those kind of social justice issues around access or drinking water quality are not necessary. Certainly not directly in CBS wheelhouse, but the water plan as the tool where we can Chinatown these issues, engage our partner, find out what they're doing and share our finding, see where we can add support, or see where we can do some coalition building together. So I've been getting to the more specific granularity of how equity or social justice issues spread out and play conservation or other issues.

0:23:15.6 S1: I think rates and being mindful of rising rates and how you support low income is important. I think that thinking about even what we live through are still loving through with covid, there's been a lot... I don't know that this was a really prevalent issue in Colorado, but certainly it was brought to attention because I think other states struggled with this water shut off issues that has... I don't know that I've seen any data where that was a sizable issue here, but I think it certainly came up during this time, so not just what you pay, but how we do or don't shut people off and what ability or what controls you might need on utilities or in a minimum discussions with them around in that space, I think are important. When we talk about education and outreach and the concept of, we're all part of the solution, are we translating things? We have a lot of language as spoken here in the state, and we're thinking about translating some of the work that we do, perhaps for the first time, and we had some minor efforts, but maybe trying to be more deliberate about thinking, at least around the water plan and these elements of that, what we translate, this equity Task Force, and on September 30th, we have a water equity conference and workshop that we're doing, and we're kind of inviting CDP as partners that cumin or that I mentioned, I'm more gonna have an open conversation about this What don't we know? Where could we do better? But certainly even some of those big conservation things, I think about turf replacement, if we need a radical landscape, change it, and you're going to just...

0:24:54.4 S1: This, I think, is a space that I would like to spend on with others, and it's a thought I've had for a while, but if your solution to wasteful outdoor landscape is removed the Church... I think there's a couple of issues there, and certainly that I've seen first hand is, first of all, you were moved her or you just shut off the water, we've got some cities like Denver or Colorado Springs who have seen that lead to urban urban blight, and that isn't just an issue of, Gosh, look rough. It's an issue for the people that are living there, if they can't afford to water and they've made the decision not to... We're talking about not just her, if we're talking about freedom, because most of the vehicle for water and trees is often longer in the grass around it, so making sure that you're doing things with a scalpel and not just taking a shot gun approach is huge. Similarly, if you're gonna say, Hey, let's pay people to remove her, I just feel... And obviously, this needs some research, but I think there's an argument to be made, so you may just be reimbursing effectively a disproportionate rate, the people that have been wasting the most...

0:26:02.8 S1: The people that have the most rate most to gain from a cash for grass program is what they call it. I think that's funny, but if you do cash progress, you're not necessarily putting money or potentially in the right place, I'd almost rather see something like that rolled out as a vehicle by which, especially for new construction, only X amount can be turned for... Maybe it's a certain kind of lower water tutor landscaping Targ, and then maybe that's a vehicle to say for those who can't do this, we can provide a bucket of money to support lower income, and now you're shifting that funding to the people that need it the most. There's a lot of inherent problems with that as you're removing some kind of retrofit removal observe is inherently tough, but I think that there's ways that you could think through that again, building off-rate structures and what a water budget might be for people, so... I don't know if that directly answered it, but that's kind of a bucket of things on my mind in that space

0:27:07.2 S2: That was very informative, I think a great answer and did give us so many threads to start to pull that into it a bit more. In a big mindful of your time that were almost 15 minutes over what we asked them, what we agreed upon, I wanna thank you so much for taking the time out of your day to speak to us about water conservation in Colorado. I know I've said it a lot, but it was very informative. Anything I do give us a lot to go and talk about what we can talk about and is again, and what we can work with with the department here, make sure to find...

0:27:41.6 S1: Well, thanks so much and apologies for all the technical difficulties at the beginning

0:27:47.3 S2: Is... Donated is complete, I'll follow up with Cristina Curtis email for any IRB issues, and when we have the report, though Colorado be one small person of it, he will focus on the great late St. Lawrence compact, we'll share our report with you.

0:28:04.7 S1: Awesome, thank you so much. Thank you. Could do retake-care

Transcription

Interview 9

0:00:02.8 S1: Okay, so let's get started, like I indicated, I know that you had a email saying that a list of these questions may not all be applicable, so we've highlighted some questions that we think are the most important and then we'll go through on any other necessary, so... Okay.

0:00:17.1 S2: So the main thing is just the context, number one, I don't work in a unit, agriculture is fairly unfunded in this, so we have one or two people that work in this program, so any of those sorts of questions related to that are gonna be very specific to me, and also... And in general, they're gonna... My responses, you had some questions that are a specific... Well, my responses are gonna be predominantly especial or just one part. Okay.

0:00:46.7 S1: Alright, wonderful. Thank you, that's helpful. Verification. So the first question in the first question on our list for you is which programs, inner policies that are implemented by you continue to contribute to conservation and efficiency across Michigan? So

0:01:04.2 S2: Within my division, I run the Water Use Reporting Program and for agriculture and Mulder and is my counterpart and not ego, and he looks to other industries. So every year have folks that are large capacity users and water reporting to us, and those are both irrigation and dairy farms, everything across the agricultural gamut except for food processing, so who processing goes to Italian considered different sub-industry for them. We also have a program called the Michigan Agriculture Environmental insurance program meet program. They meet with farmers, they verify that they're working in an environmentally sustainable fashion, in their Pronto component of that deals with water use in irrigation, and seeing that they're meeting some of the congregation measures that we've established a mistake of Michigan, so those are our primary programs. We do have, outside of my program, our food and dairy folks that also look at just the industry in terms of water, bottling and that sort of thing, although that's not really from a conservation standpoint, that's more from a health and safety standpoint. So those are the main programs that oversee that, and in terms of the policies, it's the same as part, the 27 part, those sorts of things, and also the a conflict resolution program.

0:02:48.8 S2: So we oversee the agricultural component of that, when any high capacity wells have impacts on home... On walls, that sort of thing.

0:02:59.2 S1: Did you say that was the Aqua for contact resolution program for...

0:03:04.4 S2: I forget what the formal... I forget, but it's a conflict resolution program, basically, or ground water conflict. Yeah.

0:03:14.5 S1: Awesome, makes sense. A. 317. So based off of these policies that you've just outlined for us on, which do you believe are the most effective in supporting water conservation and or efficiency, if there is a ranking or in general... If they're all the same to you. Kinda be curious to hear your resenting s. Why? So I don't know that...

0:03:42.1 S2: So under the Compact is, you know, we're required to monitor our use and these programs aren't necessarily focused on conservation, so that's not the primary focus as far is generating information, I'm water use in estate in terms... And we'll get to some of this in some of these other questions, but one of the things I... First of all, where I would say that we're not effectively... Not everybody's reporting that's supposed to be reported. So part of the key is trying to get more people to report to even have the types of baselines that are appropriate for measuring conservation, which we don't... We're not there. And so from that standpoint, I'm just trying to garner that information to the extent that makes it useful for projecting into the future what use is or what reduction of uses or what conservation abuses is our main challenge right now that we have to work... Or That makes sense.

0:04:58.3 S1: Yeah, that makes total sense. Thank you for that context. What about programs, maybe outside of what you're working on that you feel like have excelled and conservation and efficiency and... Or programs that maybe aren't conservation or efficiency-centric, you have excelled... And still meeting that goal.

0:05:28.2 S2: So public publ, public utilities, the push of high efficiency toilets, pushing that kind of product over the years probably save more money and more water over time than anything, and there was a live push mostly to reduce both costs and stress on public infrastructure. On the other hand, as we all know, public infrastructure is in dire straits, so there needs to be some maintenance and upkeep in those sectors, but I think from reaching out to clients, they've done a pretty good job... Once again, though, most of these industries have metering in place, which agriculture doesn't, so they're able to better judge whether they've made any strides in that area, so without looking at numbers though, it's really hard for me to say who has done better than some is of course, and a lot of it also is wanting to reduce energy, so in the forestry sector, paper mills use a lot of water and that sort of thing, but it's also a reduction in their waste, their energy used. All of those sorts of things. So a lot of these reductions are happening because there are secondary costs associated with it as well, and that's the case with agriculture as well.

0:07:01.0 S1: Yeah, that does make sense. And I think you touched on this a little bit, but I do have a quick follow-up question. Why is agriculture except from these metering requirements, so just...

0:07:14.7 S2: It's never been required. And there's a huge fear out there that we're gonna start metering and there's costs associated with it, but I mean people have been ordain for a long time, and so to go back and require metering on these systems is a challenge, I mean, it's not that it can't be done. And personally, this should be off the record, personally, aquifer, one thing, it actually gives them a better understanding, I think, more fully of what they're using. Right, I think it would be useful, but there's a fear of government monitoring this and potentially making people pay for... For that water resource. So

0:08:09.5 S1: Another follow-up question to the... That's really interesting. So I property or city, and my dad did consulting for farm, so this is something I've lived around for a while, and I feel

like anecdotally, there was a lot of sentiment where it's like when governments come in and apply these regulations like farmers, they lean the industry is that kind of a similar fear that your agency maybe has, or because speeding isn't even a political possibility right now, is that not really something you touched

0:08:36.3 S2: Barbara would never support it, and it's not really agency-specific, we can't drive those kind of policies... Those policies have to come from outside, we cannot advocate.

0:08:47.9 S1: Right, thank you for that context. That was actually super helpful. A long kind of similar lines to that, outside of where you're currently working, what other sectors do you think have strong potential to work to better improve... Conservation is in... I know we've talked about for some already, but something external to that...

0:09:12.2 S2: I'm trying to think of all the folks that sit on the... I don't know what are your committees which are in... So we've had people come in that have given talks at various manufacturing, almost anything requires water, and everybody is trying to reduce the cost in some some manner, and really going in and doing almost like a lean process improvement, if you're familiar with that going in assessing systems holistically and identifying sources of waste, and I'm trying to... It's been at least five years. I'm trying to think of what this gentleman is, and I can... I just can't... Yeah, I'm just like that, but it was a really interesting way that they went through to identify sources of waste and when water was identified in one of those things, so how does streamline that... I'm just kind of Elkins name right now. Sorry. No, that's okay. I probably might pop up as I...

0:10:32.9 S1: Was this like a specific study or something that we could refer to, a non...

0:10:36.1 S2: To know it was actually a specific industry, and I'm just one... Understand it was a manufacturer. Manufacture, can't think... Can't just completely... I can remember the structure of the conversation, but... No, Santa's totally fine. He'll has... This would have been... Actually, it would have been in 2014, because it was during the previous iteration of when we were coming up for someone be recommendations for conservation groups. Yeah.

0:11:07.6 S1: Okay, so you kind of just mentioned that costs or something, don't say that manufacturing and or other industries are forward to as a reason why they'd want to have better conservation and our efficiency thing in agriculture. Is there any other motivations that come to mind to you that could cause that behavior ship as well? Well.

0:11:33.1 S2: Sure, sure, there's reduction of cost, there's a reduction to an energy energy use, for some it would be potential pollution output, you don't wanna hit reduction of waste water, anything that can contribute to you meeting regulatory requirements and reducing potential impacts for some people... For some people, for some businesses, it's very important what the public perceives, so if this is something that they can put up, there's a little check for the public that we make there in a product or something else more appealing to them then... And that's kind of what our Michigan a environmental insurance program does. They put signs out on the

farms once they're fully verified, and that is something that they feel is appealing to the public, their buyers, if they've got a direct relationship with their food, their customers, then that's a big plus for them, and that's kind of wrapped up in it as well, yeah.

0:12:56.0 S1: So you just mentioned one that is something that I personally haven't thought a ton about, and I kinda wanna circle back to it as pollution output being a reason why agriculture and our industries, we wanna move away from water use out of curiosity. What kind of pollution regulations do you currently work with, if any, that man seize farms to move away from consumption. So

0:13:20.5 S2: First of all... And it's gonna be in one of your things here. You don't wanna have a lot of run-off. Producers are looking for is the highest consumptive use they can get. I mean, ideally, you wanna have 90% on some cause because that means that everything's either being taken up by the plant or where it's being released as a... Through evapotranspiration, you don't want water running off the field, and water running off the field takes a number of things with it, fertilizer, excess, pesticides, whatever, it's a contribution that they don't wanna have, so it's ideal for them to try to figure out what is the best use for their crop at the appropriate time, so that crop is taking up the most water that it can, it's unlike the thermal electric industry, which they take up use and they return the substantial proportion of what they originally kick out back to the... In the water, back to the Altai, you don't wanna do that.

0:14:33.3 S1: That makes sense. Is run off something that you actively meter as a metric or is that just kind of thing and... Totally. That farmers are aware of.

0:14:41.1 S2: No, the only time that we see anything related to that is if there is a... Right. Firm complaint where you have either off-target use of water, we had some cases a number of years ago where the end guns on these pivots were off shooting off into the roads, and so what would happen is there be a shaded area and motor cycles, we go through this area regularly, and it became a hazard because you come in and all of a sudden it's wet and they could get out and... So I had a lot of angry people about that, so not directed towards the waste issue of it, but clearly causing waste, that's just one secondary reasonable to... You don't want that to happen, but...

0:15:34.9 S1: And

0:15:35.1 S2: You don't want things running off so that there is skills... Those sorts of things.

0:15:39.7 S1: Right, of course, that makes sense. Is run off not meter, just because there's that interactive metric to measure rotor, is it a similar to... None

0:15:49.4 S2: Don't have a metric for... So right now, how people report their water used to us is either basically multiplying their capacity, so if they have something that's 400 gallons per minute and they're running it eight hours a day, then they do the math on that. Is that accurate now, because most systems number... I don't run at the full capacity of the well, so there's the

capacity that runs through the pipes and have reduced pressure, most likely it's under that, but it's an estimate, so we didn't estimate or they do it, an approximation of acre inches applied. So if you apply, if you figure you're applying an inch per every couple days, then that's what you calculate and there's 37100 or gallons per acre, so you do the multiplication, so that's what they're doing. It's pretty rudimentary, and they are estimates for sure. And the only way we can get to any kind of accuracy is with meter, that makes a lot of sense, but even so in terms of run-off, so you wouldn't be able to... There's no way you could... Could really, if you have a 150-acre field, you couldn't really tell from every end where it's coming off, and you have fields they're tiled and some fields that are not tiled, those sorts of areas where you can lose water, so there's just a lot of...

0:17:28.3 S2: There are a lot of things that go go that I just like, if you could figure that out, you can get something good. And

0:17:40.7 S1: I'd like to think that I'm smart, but I am delineate, do have an engineer on our team though, who his entire thing... I guess he's not tackle an engineer, he does water, he's like... He's a water engineer, that is what he is in that he could come up

0:17:58.7 S2: And actually, they've figured out Michigan, certain areas of Michigan were very wet. You know, the Southeast section of the state used to be the black swamp, and we're a heavily tiled state, and so the irony is we have this tile in place to move water off the land, especially for the spring, so farmers can get out and plan, but there's times during the year where it's really dry and you don't want... You don't like that water moving out, and so now they've actually started figuring out ways of better harnessing by putting some type of in-cap on the tiles that go into a drain or a stream or something like that, to be able to either keep the water in the field or not. And so that contributes a lot to irrigate on whether they're gaining or not, just keeping that soil moisture, so that's actually another important component of this that I guess I haven't really man. Talk about is really better managing the title dream systems where they exist, if you go... You're from Trevor City area, you know how Sandy it is up there. There is irrigation, but it's not like that we have down in the southeast or southwest parenteral use are...

0:19:23.3 S1: Can you explain a little bit more about what this tile system is like? So

0:19:29.0 S2: Sometimes if you're driving around, you'll see big machines in the middle of the field and they're literally running these frogs down, and they used to be... Can they used to be Cates. So now, almost all of them are some kind of perforated PVC pipe, and they literally run, they run below the soil, and so when the water trickles down, it's captured in these tiles and it runs off to the nearest drainage system, and a lot of those are county drains, their systems that we're putting into place to capture this water to move it off the land.

0:20:05.2 S1: Just to make sure I'm understanding, is the reason why these tiles exist, for example, to make sure plants don't drown, is there a purpose besides... For question. Yeah, yeah.

0:20:14.0 S2: So in the field, if you have a damp field, you can't get in, they wanna get in to the field as early as they can in the screen... Right.

0:20:24.1 S1: That makes sense.

0:20:25.3 S2: Without getting some killing frost, so climate change is playing into this quite a bit because they're able to get a feel as much earlier, but they're also, in part because they also have these systems in place, these tile systems in place. And that's certainly the case in southeast southwest Michigan. And we'll have to see porn areas, other crops that you really want good drainage for cats, some of those things. But as I said, the contrast is that when you have a really dry period and early on this year, it looked like we were gonna have a pretty significant drop until sudden... Let me just started going... Right. 'cause I, up until recently, of also mediate conflict resolution program, and those can be just not really pleasant visits with people, so we were just kind of keeping our fingers crossed and the rain was there, but it was an issue for folks if their fields were drone tiles take up away and then you're gaining more as results instead of having that maintained in the field.

0:21:44.6 S1: Is this conflict resolution? Is this the same as the AWF constraints or is this something to stand... Stations

0:21:54.7 S2: Complain, and more often than that, farmer will work with his neighbors on their own to try to kick care of that, I

0:22:04.7 S1: Do. A lot of those complaints happen due to shortage, or is there another reason why he... So you'll see it

0:22:13.8 S2: More often when a new well goes into some place and the primer is still trying to figure out what the right balance is, 'cause it can take a couple of years to figure that out, but it depends on the nature of the home owner wells around them, and usually not always, but often these are older wells that are shallower, so if you understand hydrogel-GY at all, you'll have a pump that goes down and as a high capacity well is operated, there's a cone of depression that extend out and you have... A homeowners well that comes out and it depends on where their pump is in that well system, so as the come comes in, if it intercepts and it pulls down a static water level of the home, then the PO no longer has access to water and some runs that pump Drive. And so the shallow, older... What else are sometimes impacted by

0:23:20.7 S1: The Arian feels like an efficiency problem... No, it's more the structure of the app.

0:23:28.5 S2: Or as in Hyperion where right Parents Day, so it says that everyone has to equal access to water, so the solution, the resolution for this would be that the producer would put in either... Would I either have to lower that person's pump or put in a new well for that person so that they can compete at the same level, so it might be a perfectly flush aquifer, but it's just the history of that pump that the homeowners pump was such that... The aquifer was kind in a

different state.

0:24:04.9 S1: Yeah, that makes a lot of sense. Okay, okay, along with of what we've just talked about, as long as some of these issues with getting forms to report water usage, what are there distinct issues do you face in implementing these programs that are not obviously explicitly tracking conservation, but obviously hoping to...

0:24:27.3 S2: Ntnu department, he has no funding for this... We have no dedicated funding. All the dedicated funding goes to evil, agriculture does not have to pay to report their water use and all other industries to do. So as a result, my funding and some funding of my colleague, Bob pig, is borrowed from elsewhere, what do you mean

0:24:56.5 S1: To else where it's allocated in a different part of the budget that's not explicitly for...

0:25:03.7 S2: We can get from restricting times out there. Gotcha, interesting. And this is only... This is one of my jobs I've run for other programs because of that, because we have to have that, we have to have something to fund us and keep this in place, so it's been... This actually is a significant problem for us, and so we've had to develop some... Historically, the way the water is reporting program ran is from 2004 to 2011, people submitted paper and then we would hire students or something like that to transcribe those forms coming in, the accuracy of which was not great. Dealing with the mini people, trying to figure out what their latent longitudes were without being able to see on a map, all of those kind of things, so we had a lot of not great data, and then we implemented our first database from 2011 to 2018, the... What we had issues with were tracking transfers of pumps, and so we... We updated that and then the update has had issues, so we've been trying to get around ways of getting... Trying to make reporting actually better with fewer people to monitor that coming in, so that's been...

0:26:44.4 S2: Those are our main issues is no dedicated funding, and so limited staff not being able to follow up on some of the things we need to follow up on, especially in terms of identifying accuracy of locations, that sort of thing. One thing that happens in every car that doesn't happen in other industries is that a lot of land is leased, and so it's not always the owner reporting, it's the less because even though the law says that it is the responsibility of the owner to report... We don't expect a 90-year-old widow who is leasing out her farm land to be doing the reporting, so we've always loud leasing. The issue is trying to track when those leases transfer, and in keeping that information consistent going over time, and we thought we were kinda getting there, we're hoping the new system, words building again will be better, but I'm not gonna sugar coat. We've had some issues. Yeah, which makes it hard to establish solid baselines for trying to discern whether conservation efforts are actually working.

0:28:24.5 S1: Right, definitely. That makes a lot of sense. I guess on a lighter note, what other opportunities to see coming up the pipeline around energy Clement and a water infrastructure that could potentially maybe either alleviate these issues in order to have impact outside of Ramsar working in... Well.

0:29:06.3 S2: Which question was that?

0:29:08.9 S1: Yeah, so it says With opportunities, do you see with new energy, climate and water infrastructure part program headache at really following. So it's okay. And it's okay if the answer is not that. Is totally allowed.

0:29:31.5 S2: No, no, this is interesting. And once again, I actually do have ideas for other industries, did I say it in stuff and meetings to folks, but I think in just kind of stay focused on... And one interesting observation is up and up in Grass County, you know, they have a lot of the wind farms, and I've gone out on not wearing use complaints per se, but noise-related complaints related planet Ed to diesel engines on irrigation systems. So that's kind of the context. And what was fascinating to me there is that this person had to have a diesel generated system out in the middle of this field, where 20, 300 feet away, he had a wind mill in the middle of his field, but their electricity comes from consumers, the wind mill is owned by teats on his property, he can't access any of the energy from DTE because he serviced by consumers and their energy and to bring in that electric service would be probably 40000 because it's a three-base system, so some of those kind of strange policy issues are problematic... You'll go to... And actually, I don't know, are you guys interviewing Lord out as...

0:31:14.6 S2: She's one of our ag engineers.

0:31:17.7 S1: I don't believe so. I don't think she's on our list, but we're also open throughout all of this interview process to any SEO people, you might have an... Our plan... So

0:31:30.3 S2: That might be... She might be an interesting person to talk about some of these from a different standpoint, 'cause she's also working on some of the methane digester kind of things, which of course use waste and waste water, etcetera, for all of this, and the whole issue of feeding back into the grid and Michigan's policies with that. So there's all that kind of structural stuff that would be very useful that crosses into the realm of nisar conservation, but manure management pollution and all of those externalities that are kind of inherent in agriculture. So those are kind of the opportune I've seen that really cross over in the energy climate arena.

0:32:21.7 S1: Yeah, that's fascinating, especially given how I feel like there's a strong narrative at the University of Michigan, at least that farms are the future for wind energy, to think through what that actually looks like and a feasible...

0:32:38.6 S2: It certainly has not been without controversy, the wind mills emit certain sound, all of that, whether the farmers have really gotten the kind of payments that they thought they would get from it, you'd have to really interview some of those folks directly, 'cause I've heard mixed feelings from all of them, yeah.

0:33:03.3 S1: I personally think they kinda look cool, other people do a big fan of eco-tourism,

but I think that's just 'cause I'm in here...

0:33:14.8 S2: Well, you're from an area where... That's a big thing. So

0:33:21.2 S1: Yeah, but of course, I wanna travel somewhere to see when... Well, that sounds so... I do kinda wanna respect that we don't have to time left, so I wanna... I think we've kind of gone over a lot of the kind of gaps and or general other things you should be thinking about, so I kinda wanna jump down to the more specific questions. I think one thing that we haven't talked a ton about that I'm kind of interested in is about whether or not there's a potential for things like research and development that may be all to better help advance conservation in the agricultural sector. Excuse me.

0:33:55.4 S2: They're certainly doing it. My other question for you is, are you gonna be talking with Lyndon Kelly?

0:34:01.5 S1: Yeah, but we can also... As

0:34:03.8 S2: You need to talk with Lyndon, he is the extension agent between Purdue and so... Very cool. And this is what he does, he works with producers in irrigation also, although I think he's retired, I don't know if he's accessible now, there are a couple of other people, but... What was the question again?

0:34:30.4 S1: It was about research and development, but if we should reach out to Lyndon, then... I think that is the answer to the question. Yeah. What about educational programs? What do those look like for farmers in terms of helping them figure out how to conserve and or make their practices more water efficient.

0:34:47.2 S2: Yeah, so that's what London does. So they have workshops throughout, and we are invited to participate in those as well, but mostly through the winter, through the off-season to talk about, you know, maintaining their systems, how to keep those... Ensure that they're not leaking and etcetera, and it's really focused on the efficiency of the system over...

0:35:17.3 S1: Sorry, I didn't mean to cut you off, go ahead. From a policy standpoint, that's kind of interesting to me, obviously, again, Grand charity, so mutation is super present. There is the reason why they take a majority of that, both R and D and our education work, because you don't have the capacity to do that, what is that working relationship like and is that something that is seen as a benefit to your office brand is not government's role. Gotcha. What about a generally... Why extension was set up...

0:35:49.8 S2: Traditionally, extension was always the link between... Well, R and D done usually at MSU or some place, some Ag institution, MSU was the conduit between the government and the farmers, and... So that's always been the rule. I mean, we might fund it, so we have an Ag Development Division, and they provide funding for, but mostly for value added in the bit, so after the crops come off, those sorts of things. So we would be involved in that aspect. But

generally, the government's mostly regulatory.

0:36:34.1 S1: Right. Would you see that working relationship between Ms. Extension is a strong relationship. Like, Oh, you... Okay, and so they're mostly beneficial... Right. Okay, that's good to know.

0:36:48.6 S2: No, is Mayor back, we need them to really go out and they also talk about the regulatory compliance, etcetera, so they are advocating both ways, they wanna help producers meet the requirements that they need to meet so that they can get their products out to the public.

0:37:14.8 S1: So cohesively from an implementation standpoint, obviously, we're not policy makers in this report, but in theory, if we were to think through what an implementation process would look like, MSU Extension Center would be the conduit between the state informs to help them understand what new regulations exist... Theron conservation and efficiency, not ever.

0:37:35.6 S2: What regulations and also what new technologies are out there, because they're also interfacing with the industry, so the folks that are going in and laying these irrigation lines for people, they're in touch because they have to be up-to-date, so

0:37:55.0 S1: They're... For lack of a better word, that the implementer... Okay, that's a really helpful context. I do wanna take a pause, that is the majority of our questions, I want to see if there's anything that we should have talked about that we haven't... Nor if you do have any questions for us.

0:38:17.0 S2: You had a question here about variations and geographic distribution, and it's significantly different across the state, so you just... Yeah, you just need to be aware of that. So it's very different up in your area where it's mostly the nature of the irrigation systems itself, you don't see center pivots, so I can go down, so there's a lot of fruit there, they use water for Prospero ECT on... We didn't talk about animal agriculture, which is also a user, those sorts of things, and so they all have various needs and would have different methods of trying to conserve their resources makes sense to what else is T. So in 2014, I was on the Water Conservation subcommittee and I did a paper literature on public outreach aspect of that, and really where the state has never... The states never... Well, we've talked about these issues a lot, we've never made any efforts, really any kind of outreach to the public on the need for conservation because we've always just believed that we're this water-rich state, we don't need to do this. And there are a lot of states and Canada that have done some pretty good work in this area looking at Ag, and I don't know to what extent if you're looking beith, the base, they're going on beyond that, but there are some good things going on in Florida in New York and Canada, Florida.

0:40:25.0 S1: New York, so we are looking into Ontario. Infecting other provinces in Canada now? No, it was mostly Ontario.

0:40:35.6 S2: I think that... I'm trying to remember if Alberta had something, but... No, it was mostly Ontario, in a little bit in Montreal, I think. But New York, especially upstate New York, had some stuff going on. Mostly because their water, they own New York City is supplied by a watershed that is upstate, and if you look at that whole process, it's pretty comprehensive, the management of that, which also takes into account water use.

0:41:17.6 S1: That's a thing. Thank you, and you haven't been on more to add. So I did have a question for you. I know Emily mentioned to us a little bit early on, 'cause we are definitely looking at a couple of other states beyond just what's in the compact, and so this is kind of a natural transition. She had mentioned to us that you would be a good person. Ask what other states should be on our radar, we have already come up with a list and those states include... Let me put my scope of work... Sorry, it's loading. So Maryland, Missouri, and Louisiana in... And I can get a little bit more into how we came up with those states, but just in terms of similarities in terms of... We looked at fresh water resources, water use, demographics and geography, and came up with this list of six or so states based on all of that data that really kind of matched Michigan that wasn't already in the compact, and then those were the top three in there. I was wondering if you had any thoughts about those states in particular, or if there are states that are generally on your radar that it's like, Hey, you should...

0:42:28.6 S1: 'cause I know we were talking about this in terms of public outreach and conservation, those sorts of programs, but if it also applies in terms of other programs that you're aware of or... Yeah, so

0:42:43.2 S2: As I said, Florida was one profound. I didn't look at it all. Looked at Minnesota. Arizona is not a water-rich state, but they had some really good programs. I remember that and I was in... What I was trying to do is find my... As I said, this was from 2014, so I couldn't find my literature, the citations. So that's what I was looking for. And just trying to pull it off the cap on my head, but

0:43:22.9 S1: Would you be willing if you find it, let... And again, I don't wanna take up too much of your time outside of this interview, but if you didn't find that, would you be... Well.

0:43:30.7 S2: Yeah, try to find it, I just... I was on leave before I just got back to sporting, so...

0:43:37.8 S1: No worries, thank you, I appreciate it. I can do that.

0:43:42.9 S2: And I think part of that was included in at least the final... The first original was larger, but it was included in the final recommendations, I think... In the report that came out in 2014, I'm trying to think. I had so many iterations as Ali believe and that we really need to have a good public outreach effort with us, I think that's the only way and that we have to do... The challenge is gonna be that there's such a variation across different enterprises and industries, and trying to get some kind of message out there that reaches that applicable to everyone would be difficult, so you might have to pair it off a little bit, but the essential message is still

the same. And generally people don't, they don't wanna be preached that they need to conserve, blah, blah, blah, blah, blah, they wanna know how they can do it, and that's what I remember to be the common message across all of these programs I looked at was, No, don't tell me that we need to conserve water, Tell me how to consider better... Give me some solid ways of doing that and you know, then we can talk or so...

0:45:17.5 S1: Yeah, that next a lot of sense and is definitely a good thing, crossed, I think on... I also think that's a very good and concrete up lifting out to an interview. So thank you for that. We really appreciate your time. The next steps, Russell, have this interview transcribed, we can send it over to, obviously stands the things you said off the record, if you wish to review the transcription and... Or have anything else you want to add or remove? And then by November, we are going to have a draft that is going to be circulated at the report with the finalized product happening in December of this year. Do you have any other questions or concerns or anything about coming forward? I really think it so much, Abby, were a welcome knowledge to us today, we really appreciate it.

0:46:10.9 S2: I enjoyed talking with you and good luck.

0:46:12.6 S1: Thank you with endeavors. Thank you, thank you so. Bye.

Transcription

Interview 10

0:00:00.0 S1: Conducting a. So again, I wanna make sure that we get you out of here by 1-30. So hopefully, you can move to slightly quickly. Our first question is, are there any areas where you feel like your office and or the state of Pennsylvania has explicitly excelled at meeting or exceeding the requirements in the compact in terms of water conservation and efficiency?

0:00:27.6 S2: So I'm sure you're aware that Pennsylvania is... Great Lakes Basin is not large. For Lake Erie, it's just a little over 500 square miles. We also have the headwaters of the Genesee River, which flow into Lake Ontario, that's only about 100 square miles, and so our water use is not large, I think if you look back at the 2019 water usage for Pennsylvania's greatly based, and it was only... I think it was 381 million gallons per day, which is the lowest amount of barely registers on a pie chart, it doesn't really is just a lot, and it's like 00007 or something like that of total overall water use in the Great Lakes. So from that perspective, there's not a whole lot that we can do, I think, to really reduce through conservation and efficiency standpoint, our obligations to the compact, an agreement, but that being said, we still take that seriously, and there are... Some programming that we do here on the Pennsylvania level to try to reduce that.

0:01:44.1 S1: Awesome. Is there anywhere specifically within these programs that you see or that your organization sees a need for improvements?

0:01:56.2 S2: I think if there is a place that we could improve it would be on the public tracking water supply infrastructure system, we have totally about it. It's 39 million gallons per day consumptive use inside Pennsylvania, and most of that, like somewhere around 79 or 80% of it is from public water supplies, and so that was something we identified years ago, was that increasing trainings to certify water operators inside of the base to help with leak detection and water loss reduction would be a point of advancement there, and so the Office of the Great Lakes funded... The development of a program is actually three separate programs that were given, I think two or three years ago now, and we're getting ready for another round to do that, that we reach out to those water operators and help them implement those things inside of their systems.

0:03:00.3 S1: Awesome. Out of curiosity, the number of having that much a public drinking water is pretty skein relation to other state results, we find that most water extraction comes from larger draws for industry or farming. Curious why that trend isn't Carrie in Pennsylvania?

0:03:21.9 S2: That is a good question. So our industrial sources that were major sources underneath reporting for the Compact have been industrial in nature and have mostly been essentially closing over time, so we don't have those large industrial point sores withdrawals or of the system, the rest of those industries actually take... They use water from the largest public drinking water provider inside PA, so they're kinda lumped into that into that public water supply

0:04:00.6 S1: Is farming the same where it's also kind of lumped into this public water to fire. Do you measure that differently.

0:04:07.1 S2: Now we mentioned that separately, but that being said, we don't have a tremendous number of row crops in Pennsylvania, like you might see in Ohio or Michigan, etcetera, Indiana, but what we do have is a large amount of villeneuve is a great growing what's the largest agricultural land use inside of Pennsylvania's... Great legs pass. But that being said, they don't want it a lot, it's actually... We try to reduce the amount of watering during certain periods of time in the year to reduce disease, etcetera, to the plants, and you spar it under another period of time, which is two... To get the ball, we grow most of the juice grape jam, grapes, nares and Concord, so they have different requirements. And the line grapes.

0:04:58.1 S1: Okay, good to know. But what challenges or issues does Pennsylvania specifically experience in achieving the water conservation goals that you have set in your Department... You've already outlined some of these things about withdraw in public usage, but would kinda be curious about how that plays into meeting Pennsylvania's overall conservation

0:05:19.9 S2: Bolsters the landscape, and punter are others, MPA who could probably speak way more eloquently about this than I do, but being... I have finding any to speak with you folks as of right now is... The one thing that I know that we struggle with is a periodic drought, we're a very water-wick state, and so most people just automatically think that we don't... We don't have any problems with water because we're constantly inundated, but the fact is, is that we

have periodic drought and when those instances occur, it's a pretty significant effect on our populist, so we've implemented a drop emergency provisions and an application that allows certain heavy water users places like an athletic deals, golf courses, etcetera, those types of places that have used a lot of water to be able to apply inside of this application, understand their water needs and what they need to do during it throughout emergency.

0:06:29.1 S1: Awesome, that's really interesting. What about, I wanna talk a little bit about conservation initiatives that has happened in Pennsylvania, is there anything that's worked really well that you think could be a beneficial model for other states?

0:06:43.6 S2: The most recent activity that I think would be a good reportable for you, and I don't know if Michigan as part of this group, but there was 34 states that met back in September of 2010. I was in last year. Yeah, I was 20, 20, but they had a state summit on water reeds, and that the water sense program through EPA, and what we did as part of that process was look at our water reuse profiles, some of the barriers to businesses and entities using those, and then that would allow to compare and contrast exercise for EPA between the States, and so I think that's a valuable exercise that we've been doing and hopefully will pay some dividends.

0:07:38.4 S1: Yeah, so we've heard a lot about water sends, but I haven't gotten to the point yet where we've reached out to the EPA to talk about it, is re-use something specific to the program of water sense or is that something specifically that Pennsylvania has done in response to a sense.

0:07:56.6 S2: A little bit of both. And so there was some water reuse provisions that the Pennsylvania employed prior to that whole organization of states and PA, but it allowed us to get our ducks in a row and see what some of the good things are, what our opportunities are, and I could probably refer you to somebody who would be able to speak better about that program than I.

0:08:24.8 S1: So... Yeah, awesome. I think we appreciate that, we're kind of in the process of ending our interviews, moving on to drafting, you would appreciate the connection, but I don't know if it's a guy that will be able to reach out to them.

0:08:41.0 S2: Yeah, it's kind of weird, the way Pennsylvania is going about doing this is that the water reuse and water sense program are in lunch and then you have public drinking water folks and a difference if they actually don't do that program. So yeah, I'll try to find somebody. I know Mark Matlock leads defensive in a state water planning process, which is currently underway or updates over 10 years, and I know he helps do that program.

0:09:12.4 S1: That's actually really interesting, as some of the other pretty common things you've seen in that states are all struggling with silos internally to make sure that conservation is happening, 'cause it's spread pretty thin across everywhere. I'm curious if you know what the logic was behind putting water sense in a different department or division? Whichever it is,

then the work that you do.

0:09:35.3 S2: I don't have much insight on that, sorry.

0:09:37.9 S1: No, that's okay, I know that. That's always a possibility. No worries. The next question we have is more specific to environmental justice and water equity, to Pennsylvania doing things specifically to target those goals in the context of conservation and

0:09:56.1 S2: Efficiency, as in the process of integrating diversity, equity and inclusion into pretty much every governmental function that we have, there has been an in action team created by the governor on the Governor's office level, and then each one of the agencies also has a program or office that helps integrate those into the policies that are done by that specific agency, specifically inside of the Department of Environmental Protection here we have an Office of Environmental Justice, and there's advocates inside of that office that help... Two different things. Number one reaches out specifically to those underserved areas that are not only just race-based, but also income level-based poverty areas, and trying to focus in directly our resources to help, first of all, organized committees in those areas so that the public can have a strong voice and environmental policy decisions that are made, and environmental permitting decisions that were made, and so that's just to start, we have a lot more work to do to continue integrating that into our programs.

0:11:21.7 S1: Awesome, that's really helpful context. Is that where... I'm sorry if I missed this based out of your office or division, where is that at a different point in the state as its own program inside of the Department of Environmental Protection. The Office of Environmental Justice. Awesome. But yeah, the next and were last question, we've been moving through this really quickly, so thank you, is what measures would you recommend to be added to your state water conservation efforts that are not already in place, either aspirational or just things that are happening in the future?

0:12:01.4 S2: So this is just conceptual in nature, but it's certainly something that I've been thinking about here because our water use is so low on like a 12-year running average pensive and is always average somewhere between 37 and 40 million gallons per day. It's going a little bit of... A little bit below that, but not very much, and so my concept would be to establish internal thresholds that if water use increases be on a certain percentage significantly, but it goes up 50%, and we would have additional provisions in place that will allow us to track where those increases are coming from, and I sure the conservation and efficiency measures are integrated into the...

0:12:50.4 S1: Yeah, that's really interesting. Yeah. Wow, I haven't thought about that yet. I'm gonna think about that for a

0:12:57.8 S2: Headmasters to do have to because they already use a fair amount of water, and so there are analysis implementing these things. It just... When you look at the scope of Pennsylvania, it's like any other government program, you guys are probably figuring out

already what you get out of it, there has to be an endpoint that's worth the investment of manpower and time and energy and funding, so that you get there and so we could, in Pennsylvania, invest a tremendous amount of time, energy and money trying to reduce water use by maybe a million gallons per day for Lucky, and I don't think that's necessarily where we need to focus our energies as a very... One thing I was thinking about, the DEI components of some of our work, and it's directly reflected not only in Pennsylvania, but in other places that insight or public water infrastructure, whether it be drinking water or waste water, there have been inherent areas that have experienced a history of discriminative land use and zoning policies, etcetera, and those have directly led to discrepancies and how much of the water infrastructure costs to maintain what people have to pay in terms of rates, and this is probably the next horizon on where we're going here is to examine those things identify the areas where this has happened and try to come to an equitable point where people can afford their water regardless of what's happened in the past.

0:15:07.6 S2: So I'm looking forward to that also.

0:15:10.8 S1: Yeah, that's definitely an issue. We struggle with pretty extensible industry, and so I have advice with that. Is there anything that we haven't talked about or any final thoughts you wanna leave us with that you think are important, the interview...

0:15:29.5 S2: No, I look forward to just seeing the product of your work and... Hopefully, it helps inform some of Michigan's policies.

0:15:38.7 S1: Yeah, hopefully, so moving forward, our final product is to at the beginning of December, and then we'll be distributed to internally around the state of Michigan. We've been pushing to make sure that interview respondents also get a copy of it, but it may happen after Michigan internally looks at it, it's that timeline is in there, but we will have a final product by December and we look forward to sharing it with you. If we have any questions, can we reach back out finding clarifications? Sure. Okay, awesome, thank you so much. That was super easy. I really appreciate it.

0:16:20.6 S2: Alright, well, I appreciate your work.

0:16:23.1 S1: Yeah, thank you. So yes, thank you for all the good ideas. We then to... Right, actually, yes. You in his day? Yes. Alright.

Transcription

Interview 11

0:00:04.8 S1: Great, and then with that complete is to start going down the list of questions, starting with number one, one of the biggest challenges when collaborating with partners implementing water sense...

0:00:23.8 S2: Sure, and I'll preface by saying it for all of this question, answering them in my capacity at the Ka-resurface, at my work here with pride and the states have been reaching until try not to stretch it to answers that might be... Or urban to our national program that someone employed to within to play out here in the Midwest to relax reach it might be different from private on the country or even our national partner perspective. I'd say one of the bigger challenges that have had over the years, collaboration, there isn't a great communication network in place for someone like to engage on a regular basis with partners, then just tried true email and traditional on methods of communication, we should require everyone just would be fairly proactive and you be that engagement on-going and current as programs and progress from there, and frankly, just being in a rather large region of the country, just the vast number of partners spread across the region, that's not something that I take... One person would have the time to really just stuck with... So that the challenge can definitely just be staying on top of what all the partners are doing across the region, we don't have a reporting mechanism required some reporting, Caito what's happening at potential partner or...

0:02:30.6 S2: So inside of me being proactive with the partners and seeking them out for feedback, and in which there's not a flow of information that comes my way, I sort of episodic thing that if I subscribe to an organization newsletter, I might see what's happened in their... Part of email these ship group get myself is myself so people, information that he might be flowing elsewhere then this pretty able to keep up on what partners aren't doing, and because of the voluntary Partnership Program or not, you're trying to provide us about heavy oversight, heavy role we're here to help, we can provide a systems where needed necessary, but we also can be hands-off as partner on us to be. And so each partner comes at this with their own time and resources that a perspective on how much they want to do with the partnership, some of which may be a little or even in a one-time sort of fashion, and then others might be fairly regular and ongoing over the course of many, many years, if it's an established program, and so I know which partner wants to do... How were they wanna do it only engage with our partners that we challenge, and also say just geography can be a challenge here in Troi would admit that I tend to be more involved with partners in my ear by vicinity in the Chicago land, still in an area of 5 or...

0:04:29.1 S2: It's a lot harder for me to get to Minnesota, to Ohio, to recur engage with partners. Noche, that virtually the past the number... Or in a webinar with City of Columbus, Ohio a few months ago. So it does happen, but you're in the local vicinity of where I physically work, it's a lot easier for me to hop in a car and I at events hosted by The... You're my partner, or just pay more attention to local partner activities that like people operated or pulse on what they're doing, more so than other parts of the region. I say just communicating and keep it up with what partners are active in doing an online challenge.

0:05:23.9 S1: Especially as departments on the state level, we organize, change names, and then people moving and out, it can be challenging to keep that going is something that you've noticed throughout.

0:05:36.0 S2: Yeah, and we actually had... At our agency, I'm assuming it's publicly available, we had an inspector general on... It's the right word, but the review of our program, the 84st frogs been out there on two years... After a decade or so, there was some need to sort of review how the program is going on number of fronts and partnership with one of... Nothing to do that. And there was a pretty apparent that review our program, that power nationally or engagement with partners can be difficult if someone retires and contact name changes and a marker, and that we may not know about it. So we're blasting out communication and resources to a bunch of partners that may not be received because so and so retired and keeping up with that steady turnover at our partner base, which can happen at all, or are organizations or very small, we have partners that are literally from one person operation and can turn over contact change there. And a challenge for us to pull in. So we've even instituted more recently of a confirmation process now with our existing partners to recover, establish that partnership is something that energetic or there has been a lapse and personnel that the partnership with continual further...

0:07:25.3 S2: So yeah, just the simple nature of having a large and we're at a founders or program, and I know or partnership program, even up with all the entities.

0:07:36.5 S1: Channel, moving on to the second question, how does the program address equity concerns specifically in addressing the cost of water Sense products? Yeah.

0:07:49.3 S2: So I think there's a couple of things that we've done here, one years to make sure that our water sense is seen as a way to improve access and equitable affordable water, your resource options and opportunities that the program while its main purposes to help them save water, by nature of saving water or repairs, there are cost savings that are companies with the order civics and others, absolutely trying to mirror what the ENERGY STAR program has been doing with the energy efficiency space, and the main of retraining our program can not only save water and our past can actually say, Save money for the end users of our products and services, and we... My life, for each of our products estimates on the actual water savings that they would be real, but you realize, but also the cost savings that would be realized too over time, basis, and in terms of any upfront costs of water sensor products, obviously I do product cost money by a large majority of more sell products... Have a comparable price to non-water Sense products. Sometimes initially, when there's a brand new product available, it might take a little while for the market to balance itself, but eventually over time, if the market has shown that most of our products are a comparable prices to...

0:09:49.9 S2: Not water is products. So if you're just in the market for I do toilet, 'cause you're totally progeny have a choice, you can choose to buy a water Sense product or the Non-water sarod, the cost difference should be that great, but the cost saving over time of obviously going for the Waterford would hopefully be a motivator to have a poor select the more efficient option. And I realize those cost savings. Over time, one thing that I often wish we had, that Energy Star has a part of a lot of the different labels that you see on energy using compliance, like by a friend, by a water heater, typically get giant label right on the product itself that

showcases the... Life cycle costs of that product and cost to operate those kinds of appliances and water, you saying fixtures are similar in that there is a cost to turn on the face as a cross the fort to and what is the cost of that? Over time. And so knowing that the usage is gonna be reduced by having a more efficient product like water sense fixtures, that extrapolating and calculate those costs tapes over time by focusing on purchasing horses products over open one to avert and in a more recent area that we've been engaging with our markers on are incorporating extent that affordability programs exist in community water utilities across the country.

0:11:48.2 S2: We conducted that series of roundtable workshops with partner up country and talk to water affordability programs that deserting to learn from them, where they may be incorporating water efficiency into affordability programs along the same lines of, again, if you are using less water, using only the water, you're actually looking at water efficiency in the household as something that you can not only save water, what else I say save dollars from the long run that water efficiency should actually be a part of a water or for Development Program and can make water more affordable by... First, going in and making sure that corners, big wasted and hope to business looking for leaks that we be heparan initial uses and that relevant or that it not actually being used by the action, but that also has a cost associated with them. So we reduce that, there's a dollar saving for that the actual fixture usage binay to incentivize or outright subsidize or saving fixtures like water in products to multiply, make water more affordable for those promoters in port on residents as a way that communities and utilities to really engage their customers and help them make water more affordable, prostate communities.

0:13:35.5 S2: And by the way, say one or two seen

0:13:40.8 S1: Similar relation to that, what information is the hardest to communicate to the public on water conservation?

0:13:53.0 S2: It's only the Midwest and the great Len retain the hardest part community is the necessity to save water, give it the depression or perception of that water is abundant to three months each communication, especially from a broad region-wide standpoint or even a state-line standpoint. Just always resonate with everybody trying to communicate that water efficiency or conservation necessary or you're vital to the long-term sustainability of the water resource, I definitely take hold a lot easier, it's localized areas where water shortages are being big felt or objected, or where costs have... Is a traumatic way for very Ostrander from community community point are... And even within a region like you're in Chicago, the cost of water for the city of Chicago versus summer of communities that purchase order or diary quite quite dramatically, so communication to residents and business owners where the cost of water is fairly low, and also it could be a challenge versus communicating to community protectorate is much higher... We can really see some differences in how the communication works there, so I would be the challenge is just being... You can't just put out a broadcast the entire region, an entire state necessarily, and expected to come.

0:15:44.2 S2: It does have to make sense relative of conditions, the discounts are facing that the water shortages for some community, but a higher costs that if you jump in dramatically over the past number of years, two to various challenges on aging infrastructure or maybe more Polynesia reasons there, but just finding a way to have water conservation and efficiency or resonate with the co-context does help. After implementing and using the water since program.

0:16:26.5 S1: What would you advise the next steps be...

0:16:31.1 S2: Yeah, this one to your question is, I have a tough one because it really kind of depends on which partner I talk to, if I'm talking to a war utility and they signed up for a partnership that maybe they started using some of our outreach materials that are freely available and easy to kinda grab and use with their customers, what they may do next to be very different from working with a non-profit advocacy organization or state government at... And so I really have always tried to tailor by next steps advice to the different kinds of partners that we have, and we have a light array of different kinds of partners in our inner person, which all in the end are trying to promote the program and the brand and the ethic of what? Efficiency, but how they actually get there, it can be very different. I've definitely discussed in the past with local instances and how regulations, ordinances, other forms of requirements that are federal quartets coming from, but the value of state Opal requirements to instill water efficiency in those communities and across those areas of the state, those are definitely viable and effective ways that...

0:18:13.1 S2: You mean water savings? Not through local or state-wide, and as in other cases that you might be trying to figure out ways we measure performance, and one of the things that we really stress in our recognition program, just last week, gave out or anterior programs to various partner types, the application for those awards and the process we work through to determine is it wouldn't really look at ways in which our partners have some measure impact and accounted for their work on water saving staff, point Larson or me more simple calculations of impacted residents situates. So ways that you could ultimately account for your progress and show that results are born out of the activities of raising water conservation efficiency programs, hopefully using the border sent materials is some that I recommend Leftwich the partners that have direct customer relationships and stakeholder relationships that they can have a bottom line in a water station on them. So the cool thing about working in this job is actually is that you can get to be sort of creative and after somewhat nimble and different organizations that end up working with what with the next steps with them might be or that sets for that

0:20:02.5 S1: Is very interesting. To hear about the monitoring is something we've seen for uses across the sector, later conservation across all sectors is how it's monitored, how water use is monitored and the efficiency of it, I think I lean a bit and more to the efficiency side, but that's... I think that is a really good next step, I wanna be interested to see how some states are doing that, and if they are doing that relates to what states are doing and what do you think Michigan is doing a good job in incorporating water since materials in public outreach. So I just

to clarify, you want this question and answer just relate State Fish and rangitikei, you're able to give both. What do you think the state government is doing well? And if you think there's a city, a non-profit or another a stakeholder as doing a better job, that'd be much appreciated as well.

0:21:08.6 S2: Sure, Tintin terms of the State, I haven't had as much engagement with them agencies in Michigan as I've had in other states across the region, and there are different paste agencies that maybe like player role in engaging with the residents at of issue get on water conservation and efficiency and don't know the year, just the changes in how the state agency structures, you have change names and change roles, like what not... So that bubble, I think by a large post say agencies and Michigan haven't been a part of our partnership network until recently, and the formation of the clean water advocate role here at the Michigan Department of Environment and Great Lakes, I think dated for a new emphasis on water efficiency company with some affordability or ULI access and advocate duties that they were embracing, I think really opened up an opportunity for us to form a partnership, which we did a last spring, and I definitely see some more reason to advancements of Michigan. Now, that's just one part of one agency is the possibly other parts of Eagle or other state agencies segment also play role in a water conservation and efficiency epithets-branded materials that I'd love to see more of.

0:23:17.0 S2: But I think just the most recent example of the bikaner advocate racing, our spring campaign around draining leagues or a campaign. I've been at a nice job incorporating our materials, taken the resources that we offered for for seasonal back like that, and they receive... It helps me webinars, better events, trade our resources into what they were promoting you do and the situation really nice here, pore of that across El and other state agencies there in Michigan, ONTAP RTE. I definitely had some relationships with other partners across the state, one that comes to mind from a while back is the Habitat for Humanity chapter there at Michigan, and I was able to come up to one of their conferences a number of years ago, I can speak to... On builders essentially and renovate, we on building affordable now through having that, incorporating water efficiency in those buildings are... Or home renovations areas at a non-profit group that is the on the green home Institute rebuilding advocacy organization, they have been a partner of ours for a number of years, and I've worked with their folks over time on different of re-building strategy, incorporating water efficiency and re-building technologies and educational seminars, they have...

0:25:29.0 S2: They regularly remote border sets as part of your teaching consent, the... Their resource. And so I'm always excited and impressed by the way that different partners, so you take our resources or run with it, I don't have to be there necessarily all of the time, I don't have a... It's nice if I can go to a conference and speak and maybe kick off initiative, but we do not to be there every day, and so knowing that there are markers that we can list and we rely on crosses Michigan is something that a happy to help. And also observed from afar, just at a good work that layout... I can't think of too many. Or instance, I spoke in an American Water Works at the state affiliate there should get a number of years ago and aren't too many water utility Partners in Michigan in site checked again, that might be more a product of Sooners not seen, quarter efficiency is... The major need given a the other areas that they're focused on, so I feel like I've seen more work Eichhorn from the non-profit sector or the advocates and center,

some of the watershed groups there that have looked at the relationship to water supply with water quality is lights out a variety of places across the Midwest where by communities that are growing and maybe even stretching the water supplies for presidential Devendra demand might be having an impact on the water quality of that resource, or even a pairing the resource for other consistent benefits.

0:27:44.7 S2: And so it's a watershed group or other volunteer, so type of imitation, Lotte health eHealth of certain fish or at speech needs might conserving water supply challenges and a result of inefficient use that Attunity that rely on an all... It's definitely grow to grow on the state-wide governmental and lots of opportunities that have been about a metascore of...

0:28:39.6 S1: Your next question, and I have a follow up. So there's a question, in your opinion, what great LeSage just the best job in implementing a lot of conservation and efficiency, maybe a follow-up question to your last responses, you see state department, that's not you, or a DNR or environmental protection that works in lier conservation into their programs, well, or work with you in any capacity, so the question six is the best state in your opinion, and do you see any other state department in any state that's not the traditional DNR, Eagle equivalent, implanting some water conservation plan or talking to you...

0:29:21.5 S2: That's not a sin. Environmental fences, that were your...

0:29:28.6 S1: 'cause you talked about state-wide, you hope to see more, so maybe there's an education or health and human services department in other state that you've seen passing by or in Illinois.

0:29:43.1 S2: We answer the question, probably one of our frame routinely like it state to the best job on conservation efficiency, that's a scary towards urgency to later efficiency has done in terms of their separate... Naturally on the Baroness, some focus to retention on certain aspects of conservation and efficiency, like water loss programs, just because... Hey, I don't have criteria for berates, sail outsource ways, but conservation efficient that really does play out in a variety of laser region and some across the punisher one state might be really do an awesome job on, say, promotional outreach in tutorial mentalist, and Dan and I know some that Stavanger State Fair on A minuses and having a stake there, amenities idents there, but medications, their states are doing a really great job on more of the earlier for the regulatory requirement alfreton in their state. And so it's almost like trying to compare apples, normalization card is trying to do a good job at looking across the vast array of conservation programs, an area that having some measuring up savers another, but unless there's so many things that frankly do have conservation efficiency better outside of the snow or bartered, try to make a point earlier that was set, it's not on me all...

0:32:08.2 S2: When it comes to water conservation at a lot of other things out there that we just haven't got to yet, or we have a grown as a program to support yet, so I would wanna diminish the great work of entity to a conservation efficiency that aimed to be a percent and a senior cortina, Noreen, terms of your impression about other state agencies that are doing

some things or as an environmental lenses, one that comes to mind. Wisconsin is a Worcester, their service mission, and this is a regulatory body, the oversees water and energy utilities, and they have a variety of programs for water efficiency that are in and run out of this service meshes An have been a partner of ours for a number of years, I'm giving them an award in the past, back sincere petition of worries go. And they do a lot of great work in partnership with the scouts and dreams, Les have their own mechanism to engage with utilities, and I say that both order and energy utility in this case, because there are some combined considerably others, combine water energy, utilities. Where you're really that start growing the concept of water energy efficiency as a combined effort, where water savings is more working with operate an electricity or really not bring all waffen programs together in a nice way.

0:34:22.5 S2: And the BC also, they have a variety of reporting requirements for what utilities around the area of water control programs, and we get their distribution is the efficiency, not alliteration program support area per se, but some of that definitely does intraparty of efficiency and texture that is fiction to the Public Service Commission, there is nothing seems already, but yeah, the state aces tend to be for the and or the environmental pipette agency that come to mind that also doesn't work, Waterton efficiency or the financing authorities, and again, this plays out differently in different states where for instance, in Indiana, they have their own standalone financing authority separate from the party management, so all of their science or the infrastructure financing programs of the institute is in finance authority there, and so they along with their ability to issue loans and grants to communities through a repetitive process is two dollars from the trunk, the federal government at grant to the state and make it starvation programs, but they score and rank the projects that come in and they work at aspects of existing water efficiency existence ability, firestorm projects that come in on a holiday or different bones and grants to...

0:36:22.7 S2: One, we definitely support that aspect, dictate infrastructure dollars that are being spent are gonna get for projects that are on a busier officially even addressing a water saving measure like replacing to be water is for installe meters or other mechanisms of the detail it to save water. So those financing authorities to different states differently, their ability to incorporate order, efficiency and sustainability or systems into their project review program is everything that we do we support to making sure that our infrastructure dollars are environmental program dollars going for optimising Roberts in the community on long term cost saving the customers reply on long-term costs, that's the way it installs that are spent that are not going for stuff that I provide some rather...

0:37:41.8 S1: That's really informative. Thank you one more physically, I see. What, coming towards the end. A follow-up question, it's our understanding at Illinois has incorporated EPA water sent into law to let... Into legislation. Do you know of any going off for your next step of monitoring, do you know of any parts of that law that incorporates monitoring, the implementation of water sent or the monitoring of the water conservation same or the cost savings of water sensing that Bill...

0:38:15.4 S2: Just far as to what our... Into the OR? Requirements or learners.

0:38:25.2 S1: I believe. So yes, that uses water send products in new homes and new businesses, industries in new construction, you know if it is any monitoring aspects to that bill of water loss, water savings are conservation or efficiency.

0:38:52.8 S2: Simple ADAS probably till, I don't know, track state regulations all that closely... My understanding is that they're really like an R, and the communities that are applicable-based requirements just being that are using like Michigan Water. So it's Chicago land. They are required to have an ordinance, some of Ordinance that requires purchasing up order and products. I don't know how much oversight and enforcement or feeling like is doing sure that all those codes are Venice and A from the purchasing of water sense products, but I think that profit on, you can say about most any that's frankly, how well the enforcement is... It's maybe how effective a, but it's in place, and it is a condition on the permit and the forecourt date access to cinders in all these communities that already had access to aficionado expert providers. You're expected to have the Oracle as a condition of their permit, and that new communities that might wanna come in to get through Michigan Water and apply for apartment is happening right now with non-state community is Julie from punching from like their groundwater community there, seeing a legislator there, as we speak, applying for a permit, if you get access and then expect a department to have an ordinance for their residents to purchase or sense products, and then they have other aspects and get that permit around reporting to the state on their water loss programs so they have to do annual audits of their distribution system and calculate their water was a report to the state, so I believe that it's happening on a regular basis, and the state Rittal information in its available publicly and for systems that have a high threshold of water loss or physical death, other parent losses through active years and want...

0:41:39.2 S2: Happy, but your March water was thresholds do require those communities to take good steps to antiphon terms of actual savings, a calculated that when I'm not aware of the State actively monitoring that you track and account for saving over time or retrain program beyond just the expectations that are...

0:42:14.7 S1: Thank you so much for your answers, for your responses, for taking the time to email and answer your questions, and I just talk to recording

Written Responses

Interview 12

1. Are there any areas where you feel that your state has excelled at meeting or exceeding the requirements in the Compact in terms of water conservation and efficiency? Where do you think improvements could be made?

Water users with a withdrawal capacity over 100,000 gpd (approximately 70GPM) are required to obtain a water withdrawal permit which limits their water withdrawal and requires water conservation measures including preparation of a water conservation plan, metering, tracking repairs and upgrades to the supply system, and annual water reporting. The annual water reports have been a very useful tool for monitoring water usage and adherence to permit conditions. Water use over time can be tracked to show if conservation measures are effective. In 2019, New York State adopted a law requiring showerheads, bathroom faucets, toilets, and urinals to meet the EPA WaterSense standards. This law comes into effect in 2022 and should result in significant demand reduction as old fixtures are replaced.

2. What sectors do you think have the greatest potential for improving conservation and efficiency and how does your state work towards making improvements in these areas?

   Irrigators (golf courses and agricultural facilities) have the greatest potential for improving conservation and efficiency. These are two sectors that use water mostly during peak demands. Many still use outdated and inefficient irrigation methods.
   What challenges or issues is your state experiencing in achieving its water conservation goals and objectives? How are you overcoming these challenges?
   Retrofitting old fixtures on a large scale can be costly and time consuming. For large water users, issuing a water withdrawal permit that lists water conservation measures is a good way to address this. Additional conservation could probably be achieved by private/residential water users which DEC hopes to see through implementation of the EPA WaterSense standards.
3. Are there any conservation initiatives that your state promotes that you think could be beneficial to other states?

   Permitting & annual water reporting for all facilities with capacities over 100,000 gpd (70 GPM). The EPA WaterSense standards for fixtures are developed to reduce unnecessary water use while preserving customer satisfaction. Requiring WaterSense fixtures as NYS did with our 2019 law will promote conservation and reduce both customer water bills and water agency spending on energy and treatment chemicals. The law had a delayed effective date to allow vendors to deplete existing inventory and reduce any commercial impact. Prisons and secure mental health facilities were exempted for health/security concerns. New York DEC and DOH have also begun a process focusing on Drinking Water Source Protection Planning buy municipalities that includes sustainable supplies and water quality objectives.
4. Which programs/policies implemented by your agency/organization do you believe are the most effective in supporting water conservation and/or efficiency in your state from an environmental justice/water equity perspective? Why? See below.
5. Are there any areas where you feel that your state has excelled in terms of water conservation and efficiency in terms of environmental justice/water equity? Where do you think improvements could be made? See below.
6. What measures would you recommend be added to your state's water conservation efforts that are not already in place?

Some withdrawers do not currently have a water conservation plan as a permit condition. As these permits come up to renewal, we plan to include a permit condition requiring water conservation plans. A water conservation plan is only effective if they are updated and enforced if necessary.

DEC's Environmental Justice Group and Great Lakes Program have provided additional information in reply to questions 4 and 5:
First, there are no water conservation programs in New York State that are specifically addressing Environmental Justice issues. However, the Drinking Water Source Protection Plan (DWSP2) mentioned in #3 above is currently under development and it pairs communities with staff and consultants at no cost to evaluate potential threats/contaminants (including unsustainable supplies) through the development of an overview of their water system. Communities then work with staff to identify protection and management methods as well as an implementation timeline specific to their municipality. Finally, participants develop a Project Management Team made up of community stakeholders, local government officials, and agricultural/industrial/business representatives. This program puts the towns in the driver's seat to learn about and protect their own drinking water sources while building capacity by working side by side with state staff and consultants. The program is considering implementation of Environmental Justice specific recommendations. DEC also runs this program in conjunction with DOH, DOS, and Agriculture and Markets.
https://www.dec.ny.gov/chemical/115250.html
Next, would be NY's Community Impact Grant program (CIG), Innovative Green Infrastructure Program (IGIP), and Climate Smart Communities (CSC) program. Although these programs are not specific to water conservation nor exclusive to EJ communities, there are a number of Grant proposals that have projects that do contribute to water conservation in EJ and socially/economically impaired communities. To be eligible for the grant they must be a community group working on a project that is located in or serves an environmental justice community. https://www.dec.ny.gov/public/31226.html
Additionally, the New York Great Lakes Program's Action Agenda, although not EJ specific, incorporates EJ principles as a cross-cutting program objective. The Action Agenda focuses on the overall protection, revitalization, and monitoring using ecosystem-based management approaches to complement existing regulatory programs. Opportunities exist for much of the work to focus on rural, environmental justice, climate adaption and resilience to the changing climate. This includes investing program funds into small grants that enable communities to plan and implement pilot projects or develop needed capacity for long-term water management programs. https://www.dec.ny.gov/lands/25562.html#Action

Written Responses

Interview 13

1. Are there any areas where you feel that your state has excelled at meeting or exceeding the requirements in the Compact in terms of water conservation and efficiency? As far as we know we are the only state that surveys all 10,000 permit holders on their conservation efforts on an annual basis MN Water Conservation Reporting . The new Water Conservation Reporting system tracks the conservation efforts of cities, commercial, industrial and institutional sector (CII) and irrigation and livestock operators. The program is voluntary but we have over 90% participation of cities serving over 1,000 people. This reporting system highlights conservation efforts, nudges permit holders to improve their efforts, and provides them with an annual summary of their water conservation work. Where do you think improvements could be made? Ideally water conservation reporting would be mandatory.

   The other area where MN really excels is with the University of Minnesota Technical Assistance Program (MnTAP). This program pairs environmental and engineering students with business and industry to find and implement water conservation measures. This program has saved billions of gallons of water. Where do you think improvements could be made? At one time the program was free for businesses, now they have to pay for a three month summer intern, which is a modest investment.

2. What sectors do you think have the greatest potential for improving conservation and efficiency and how does your state work towards making improvements in these areas? There are industry leaders and careless operators in every sector. We tend to focus on the larger cities first, since they use the most water. Xcel Energy has been a national leader in renewable energy and this has led to huge reductions in water use. Businesses in general are concerned with costs and have an economic incentive to conserve water. Up until 2021 natural rainfall has been abundant in most of Minnesota. With this year's drought we saw a tremendous increase in water use for agriculture, golf courses, landscape irrigation. We have significantly increased our communications and outreach to these sectors.

3. What challenges or issues is your state experiencing in achieving its water conservation goals and objectives? How are you overcoming these challenges? Mine dewatering is exempt from water conservation, however, it would be good if we could reuse this water in some beneficial way. See the annual Great Lakes Water Conservation Report.

4. Are there any conservation initiatives that your state promotes that you think could be beneficial to other states? Both items in #1 could be replicated in other states. We also make use of the EPA WaterSense educational and promotional materials.

5. Which programs/policies implemented by your agency/organization do you believe are the most effective in supporting water conservation and/or efficiency in your state from an environmental justice/water equity perspective? Why? Minnesota has a rather unique Well Interference Program. This is where a private well homeowner (often rural and poor) has their well go dry because a nearby large water user has used so much

water, that the water level drops. In most states the homeowner has to take the large water user to court. In Minnesota, the DNR investigates for free and if the large water user is found responsible, they have to pay to restore water the homeowner's water supply (usually lower the pump or drill a new well). New wells typically cost $8,000-$10,000. Large water users know when they get the permit that this may happen, so it is an incentive for them to conserve water.

6. Are there any areas where you feel that your state has excelled in terms of water conservation and efficiency in terms of environmental justice/water equity? Where do you think improvements could be made? Except for private well owners mentioned in #5, in Minnesota, individual cities address this topic. At this point, I am not aware of any statewide mandate related to water equity and water conservation.

7. What measures would you recommend be added to your state's water conservation efforts that are not already in place? We need stronger indoor/outdoor water appliance building codes and ordinance, including promoting water reuse. There is a need for a general attitude change that values water and greater promotion of water efficiency and conservation. Many people and business are especially wasteful with lawn irrigation.

Written Responses

Interview 14

1. Are there any areas where you feel that your state has excelled at meeting or exceeding the requirements in the Compact in terms of water conservation and efficiency? Where do you think improvements could be made?
   The state of Ohio requires applicants for water withdrawal and consumptive use permits to provide a detailed plan that demonstrates that environmentally conscious and economically feasible water conservation measures are included as part of the proposed operation. In cases of proposed substantial groundwater withdrawals, applicants must submit a thorough groundwater model and report to ODNR for review. The applicant must demonstrate that their proposed operation will not detrimentally impact the aquifer and that a plan is in place to mitigate shortages if existing groundwater users within the defined cone of depression are affected. These requirements assist in the management and conservation of the water supply, and Ohio would benefit from similar requirements for surface water withdrawals.

   In calendar year 2020, significant effort was made to establish a Water Conservation and Efficiency webpage that resides on the ODNR Division of Water Resources Website. Focus areas include water conservation education for teachers, various water use sectors, and homeowners. We provide publications, tools, and fact sheets developed by ODNR and other agencies we have partnered with. Resources for agricultural operations,

golf courses, landscapers, public water supply systems, and industry/manufacturing sectors are available currently with plans to add the other use sectors. To better engage the public and all water users, we have established an open forum on our webpage that allows for input regarding water conservation. We encourage all water users to submit best management practices, initiatives that are working well/ ones that are not, and suggestions for ODNR staff. Water Conservation | Ohio Department of Natural Resources (ohiodnr.gov)

As we continue to rebuild our Water Conservation Program, we have identified a few areas where improvements can be made. Water quantity assessments, including community specific water management plans have not been updated to reflect current water needs. Updating these would help identify potential water shortages, storage needs, and water use forecasts.

Additional information on how all reporting water users across sectors are incorporating water conservation and efficiency measures into their operations would improve ODNR's ability to assess water quantity and refine water management plans. This information is not currently collected during annual water withdrawal reporting.

2. What sectors do you think have the greatest potential for improving conservation and efficiency and how does your state work towards making improvements in these areas?
   Aside from the requirements for water withdrawal and consumptive use applicants, all other water conservation and efficiency programs in Ohio are voluntary, except for mandatory water reductions specified in pre-existing laws (such as the Ohio Emergency Management Agency's Emergency Operations Plan). Sectors such as public supply, mining, and hydraulic fracturing have significant potential for improved conservation and efficiency efforts if additional requirements are in place. In some cases, additional regulation is desired by water users as well, and ODNR is currently engaging with these users to define needs and best management practices.

3. What challenges or issues is your state experiencing in achieving its water conservation goals and objectives? How are you overcoming these challenges?
   While staffing and funding continue to be an ongoing issue, another problem is the lack of either economic incentives or penalties for water users who are implementing conservation measures and those who lack such measures, respectively. ODNR's options and strategies for improving water conservation and efficiency across sectors is hindered by not being able to incentivize water users to adopt improved methods for managing their water use. To overcome this challenge, ODNR is focusing efforts on education and outreach and examining ways to better connect with large water utilities and the public more directly.

4. Are there any conservation initiatives that your state promotes that you think could be beneficial to other states?
   ODNR hopes to create partnerships with large water utilities to help promote conservation education statewide. Additionally, Ohio's Project WET (Water Education for Teachers) includes water conservation in its curriculum and is an excellent way to engage with a diverse group of community leaders and students on water related topics.

5. Which programs/policies implemented by your agency/organization do you believe are the most effective in supporting water conservation and/or efficiency in your state from an environmental justice/water equity perspective? Why?
   The requirement for applicants seeking a water withdrawal and consumptive use permit to demonstrate a plan for water conservation/efficiency, backed by a quantifiable model in the case of groundwater withdrawals, is not only effective in supporting the state's goals in this area but also provides the opportunity for the public to engage with the process. Once an application is received and verified as complete, it is added to the ODNR website and a 30-day public comment period commences. Ohioans both within the communities directly affected by the proposed operation and those elsewhere in the state can ask questions, express concerns, and communicate directly to ODNR in this way. The public comments are considered as a component of the application review process. This not only helps ensure the ODNR's review is more holistically informed, but it motivates the applicant to develop an operation that is more sensitive to the needs and concerns of the local communities they propose to work within.

   In 2019, Governor Mike DeWine launched the H2Ohio program with an initial investment of $172 million to strategically address serious water issues that have lingered for decades and worsened over time. While much of the program is water quality driven, it also examines failing drinking water sources, wastewater problems, home sewage issues, and aging infrastructure. All of which correlate with water conservation initiatives. The statewide collaboration between ODNR, Ohio Department of Agriculture, Ohio EPA, the Lake Erie Commission and many others share a mission to work together and invest in projects across Ohio to provide long term economic and water sustainability benefits. Projects include wetland restoration, BMPs for the agriculture sector, and improvements for drainage management.

6. Are there any areas where you feel that your state has excelled in terms of water conservation and efficiency in terms of environmental justice/water equity? Where do you think improvements could be made?
   The responses to question 5 detailed an area of excellence in terms of water conservation/efficiency policies that support environmental justice/equity. Further improvements could be made by applying similar measures to significant surface water withdrawals. This would increase transparency and promote water equity in the context of permitting hydraulic fracturing operations in the state, for example.

Each Ohio county has a designated local Soil and Water Conservation District. These programs provide technical, financial, and educational resources to meet the needs of local land and water users for conservation. Conservation Districts develop and implement programs to protect water in both rural and urban areas.

7. What measures would you recommend be added to your state's water conservation efforts that are not already in place?
   Economic incentives and/or penalties for water users would substantially bolster the state's ability to broaden water conservation efforts.

   Greater cooperative efforts between federal, state, and local agencies would be highly beneficial. Many are working towards the same goals.

Written Responses

Interview 16

1. Are there any areas where you feel that your state has excelled at meeting or exceeding the requirements in the Compact in terms of water conservation and efficiency? Where do you think improvements could be made?

   Indiana's implementation of the Compact establishes that conservation and efficiency programs for the basin are voluntary and have been outlined in IDNR's Report on Indiana Water Use Efficiency and Conservation. All proposals for new or increased water withdrawals must incorporate sound and economically feasible water conservation and efficiency measures to minimize the waste of water within the Great Lakes Basin (GLB).

2. What sectors do you think have the greatest potential for improving conservation and efficiency and how does your state work towards making improvements in these areas?

   The Industrial sector represents the largest percentage of water withdrawals being made within the GLB in Indiana, with about 466 billion gallons of reported water withdrawals for the 2020 year (about 83% of total withdrawals for the GLB for 2020). That being said, the sector has seen a gradual decrease in total annual withdrawals over the last several years, a difference of about 76 billion gallons from 2016 to 2020, largely due to conservation efforts within the industry.

3. What challenges or issues is your state experiencing in achieving its water conservation goals and objectives? How are you overcoming these challenges?

   In accordance with Indiana's implementation of the Great Lakes-St. Lawrence River Basin Water Resources Compact under IC 14-25-15, the Indiana Department of

Natural Resources Commission may not adopt rules to establish or otherwise implement a mandatory program that governs water conservation and efficiency under the Compact unless the Indiana General Assembly adopts an act authorizing the adoption of the rules.

4. Are there any conservation initiatives that your state promotes that you think could be beneficial to other states?

   The Indiana Finance Authority (IFA), in cooperation with the Indiana Section of the American Water Works Association and the Indiana Rural Community Assistance Program, has conducted a non-revenue water analysis of 473 public water supply utilities in the State. Data gathered from the 2019 water audit can provide opportunities for improvement in a utility's water management process. More efficient operations can also lead to financial savings for the utility, a longer lifespan for infrastructure, and preservation of Indiana's water resource.

5. Which programs/policies implemented by your agency/organization do you believe are the most effective in supporting water conservation and/or efficiency in your state from an environmental justice/water equity perspective? Why?

   The rule promulgation process established by the Indiana Department of Natural Resource Commission provides for public notice and comment to allow for the involvement of all people with respect to the development and implementation of any future water conservation and/or efficiency programs.

6. Are there any areas where you feel that your state has excelled in terms of water conservation and efficiency in terms of environmental justice/water equity? Where do you think improvements could be made?

   We are not familiar with programs or policies that the State of Indiana has excelled regarding water conservation and efficiency in terms of environmental justice and water equity.

7. What measures would you recommend be added to your state's water conservation efforts that are not already in place?

   Considering current program funding/staffing of Indiana's implementation of the Great Lakes-St. Lawrence River Basin Water Resources Compact, no water conservation and efficiency efforts in addition to those already implemented by the State of Indiana are recommended. The State of Indiana's Water Conservation and Efficiency Program Review for 2020 is attached for your information.